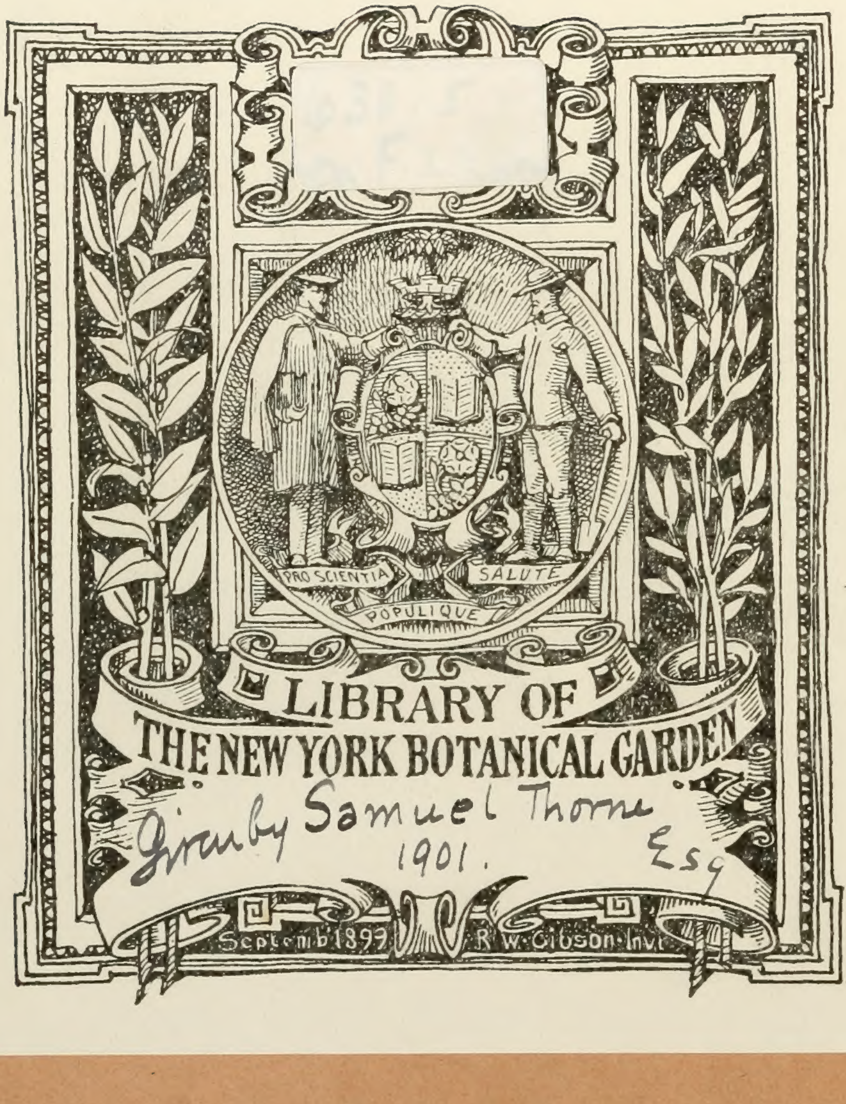

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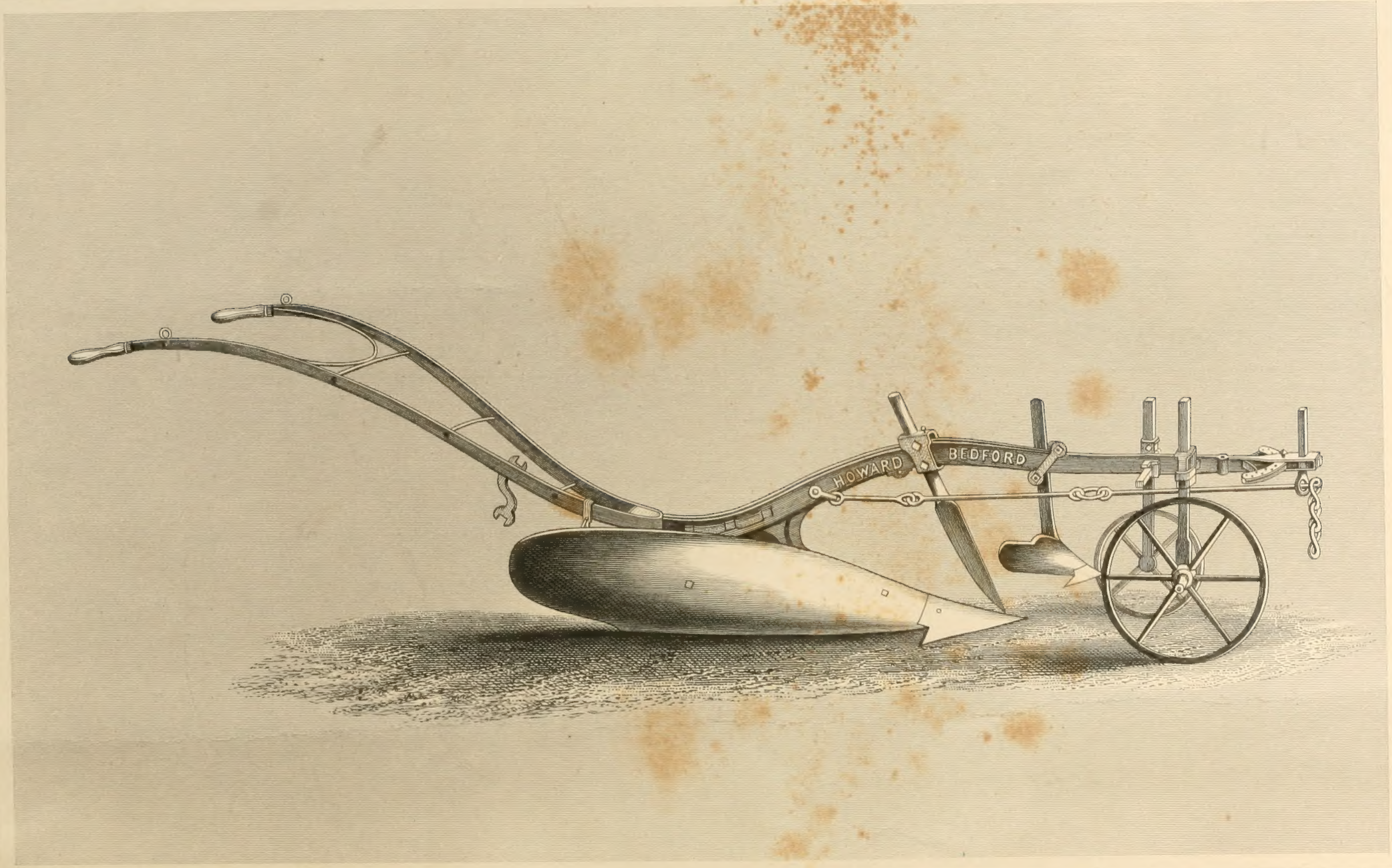

Engraved by S. Allen.

Howard's Champion Plough.

The Winner of fourteen First Prizes at the Meetings of the R. A. S. of England; and
"the Best Plough for General Purposes," at the Warwick National Show in 1859.

Ever Yours very truly
James Howard

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THE FARMER'S MAGAZINE.

VOLUME THE EIGHTEENTH.

(THIRD SERIES.)

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THE FARMER'S MAGAZINE.

JANUARY, 1860.

PLATE I.

PORTRAIT OF MR. JAMES HOWARD.

PLATE II.

HOWARD'S CHAMPION PLOUGH.

THE BRITANNIA WORKS, BEDFORD.

MR. JAMES HOWARD,

OF THE FIRM OF J. AND F. HOWARD, MAKERS OF THE CHAMPION PLOUGH, BEDFORD.

The name of Howard has long been associated with Bedfordshire. In a period of comparatively past history, it was pushed beyond the precincts of the County, and made familiar to the world, by one who claimed it as his title in the cause of humanity, and as his passport to the privilege of doing good. In this, but another epoch in its annals, the name promises to become equally well and widely known. The Howards are still engaged in the great work of civilization. Fortunately for us all, the aim is now a far more grateful one. The bonds of ignorance have been snapped asunder, the heavy weight of oppression has been removed, and the grim darkness of despair has been dispelled. The next care is naturally to make the most of the opportunity that is offered—to put industry in the right path, to render honest labour really lucrative, and to do the best by the fruits of the earth, and the fulness thereof. And here, again, a Howard of Bedford, is as deservedly distinguished. In fact, the career of the one would seem to be but the fitting forerunner of the other. Neither will assuredly be without honour in his own country; while the energy of either is even by this recognised far over the limit of local influence, or of merely momentary repute.

If, in this second era, the success of the Howards has been but gradual, it has yet been rapidly achieved. The fame of the Bedford plough, its very rise and progress, scarcely trace further back than the experience of the last twenty years. It dates as almost contemporary with the opening of that great chapter in the records of modern husbandry, when the Royal Agricultural Society of England was established, and the talismanic Lines of Railway communication brought the different customs and practices of the kingdom into ready and continual contrast with each other. For some years previous to this, Mr. John Howard—the father of the two gentlemen who at present represent the firm—had been doing a good business in the retail trade with ploughs; that is, he acted as agent for, or sold the implements of other manufacturers. Not, however, getting in this way quite the opportunity he could have wished, Mr. Howard, in the year 1836, determined, like Nelson, to "have a Gazette of his own," or, in other words, to see if he could not sell a plough of his own make. The extensive premises of the old "Barley Mow" inn, in the High-street, were purchased at an outlay of some three thousand pounds; one or two of the leading farmers of the County were consulted, and the Bedford plough was fairly launched. The original intention was but a modest one, for it aimed at little beyond supplying the Shire itself or the more immediate vicinity. But the fame of the plough gradually extended, while its projector wisely confined himself to the exclusive study of this one branch of business. The practical men were again and again called in, as they ever have been, to suggest alteration, and to point to yet further improvement. And still the Bedford plough worked on, until the opening day of the Royal Agricultural Society endorsed its many merits, and established its reputation. From that very period the Society's *Journal* itself is but one continued chronicle of the Howards' success as implement manufacturers. At the first meeting, at Oxford in 1839—and we were there to see—"the plough exhibited by Messrs. Howard of Bedford, of small size, with a mould-board or furrow turner of excellent form, calculated to give the least resistance in turning over the furrow, was *much approved.*" The Society could say no more, for there were no prizes for implements in those early times. At Bristol, "with regard to the excellence of the work done by the ploughs, as well as the lightness of draught, the palm of merit is unquestionably due to Messrs. Howards' two-wheeled implement; the furrow bottom being left cleaner and flatter, the slice better turned and placed, and the depth more evenly maintained, than by any other of the competing ploughs. The dynamometer not only proved this plough to draw four stones lighter than any other, but also that it exhibited a peculiar steadiness of movement and uniformity of draught." At Derby, "Messrs. Howard of Bedford appeared to have lost nothing of their excellence." At Shrewsbury, according to the dynamometer, "Howards' plough took the least draught as well as made the best work, a result quite consistent with the experiments previously made at the Society's trials." At Southampton, "very good work was done on the light as well as on the stiff soil by Messrs. Howards' ploughs." At Newcastle-on-Tyne, "the manifestation of superiority in favour of the two-wheel plough made by Messrs. Howard of Bedford was unquestionable, and in all respects such as would guide the judgment of a competent farmer in his choice of this important implement." At Northampton, "for the trial of ploughs on light land twenty-two were selected, and the prize awarded to Messrs. Howard, the judges being quite satisfied with the numerous and excellent qualities of their plough, which implement they considered did great credit to its makers." At York, "we decided that Messrs. Howards' plough was the best—even amongst this numerous and excellent class." At Norwich "the land was of a hard and stubborn character, and we awarded the prize to Messrs. Howards' champion plough." At Exeter, "after a few rounds the plough by Messrs. Howard of Bedford showed itself to be superior." At Lewes, "a new feature in Messrs. Howards' ploughs deservedly obtained the Society's medal. The improvement consisted in making the box or nave of the wheels so as to preclude the possibility of dust, soil, &c., being cast on the spindle, thus obviating a defect so commonly observed, viz., that the wheels, if even constantly oiled, are ground untrue." At Gloucester—"Ploughs for general purposes:—Among the number sent out for trial the superiority of that class with which Messrs. Howards' name has been so long connected was soon evident." At Lincoln, in speaking of the deep-ploughing the judges say, "The work done by Messrs. Howards' plough appeared to us not only the cleanest cut, but the most effectually turned and laid up. We awarded the prize to Messrs. Howard." At Chelmsford the culminating point in this history—"Ploughs for general purposes:—the performance of Messrs. Howards' was upon the whole such as clearly to entitle it to be placed the first in this class.—Ploughs best adapted for heavy land:—The result of this trial afforded a striking proof how ample and complete is the control which our best-constructed ploughs now give over the most stubborn soils in the country. The judges awarded the first prize to Messrs. Howard.—Ploughs best adapted to light land:—The superior work of Messrs. Howards' plough, combined with its lightness of draught, induced the judges to award to them the first prize."

These reports, given it must be remembered on the very highest authority, are the best evidence we could offer to the practical value of the plough, as well as the elements for the story of its rise and progress. Since the sign of "The Barley Mow" was pulled down, and the yet more agricultural type of "Speed the Plough" hoisted in its stead, the Howards have not been a year in the business but they have found that business increase. They began, as we have already inferred, at a very happy time, when farming was fast coming into fashion, and railways, as it has been declared, first afforded the due development for that now great interest, the agricultural implement trade. Never, however, did the Howards receive so great an impulse to that trade, as during the time of the Great Exhibition in, 'Fifty-one. It told equally on their home and foreign connection, as we believe indeed was the case with many of their fellows. The next great stepping-stone was at Chelmsford, in 1856, when the champion plough was *first*—*first*—and *first*—in the three classes, and the town's-people of Bedford set the church bells ringing on receiving the announcement of so complete a victory. They had "a Gazette of their own" by this time. If not altogether equally successful in the recent contest at Warwick, the general purpose plough was still pronounced to be invincible, while there was not an implement in trial from the Bedford Works but that took its position and premium. It must not be, either, assumed that in thus heralding their name and fame elsewhere the Howards have been only without honour in their own county, or that they could not go back to their first place for a character. It must the rather be borne in mind that the Bedfordshire farmers have always had an active interest as it were in the well-doing of the Bedford plough, and at the County Meetings it has generally held its accustomed lead. At the anniversary show of the Shire Society in the autumn of the past year, the implements sent out from the New Britannia Works—ploughs, harrows, and horse-rakes—took seven out of eight *first* prizes, and another seven out of eight *second*. It was some years since, on the occasion of one of these local anniversaries, that Mr. Charles Howard, of Biddenham, the now well-known sheep breeder, took the first prize in the Farmers' Sons and Pupils Class, with a plough of his brothers' manufacture. The late Mr. Pusey, who was present, referred to the fact as an especially happy illustration of the motto of the *Journal*, "PRACTICE WITH SCIENCE." It was at the same dinner too, that this distinguished agriculturist christened the winning implement "the Champion Plough," a title that the Firm at once took up, and by which it has been since so widely recognised.

Let us here offer some accompanying description of the Champion Plough, which appears as the companion plate of this number. The ploughs, then, termed by the Royal Agricultural Society of England, "General Purpose Ploughs," are the only kind that are tested on both light and heavy land. Those of course found to work best at different depths on both soils, with due regard to lightness of draught, are considered the most generally useful. This point is put with some significance, as such ploughs are awarded a prize of a larger amount than for those of any other description; and consequently the prize for the best plough for general purposes is considered the chief prize of the year. The one here shown is an improved form of Messrs. Howard's original and well-known prize plough. The main feature is the perfect and elegant form of the share and mould-board, which are constructed upon geometrical principles, with a view to lightness of draught, turning the work in the best manner, and working clean on sticky soils. It was proved at Warwick that this form was equally well adapted for heavy as for light land. There is just at present some diversity of opinion as to the degree of convexity which should be adopted in mould-boards. The Messrs. Howards maintain that taking all seasons of the year into account, a slightly convex form is best. Another feature in this plough, is the simple and admirable manner in which the share is attached. The neck upon which the share fits is a plain bar of wrought-iron, tightened by means of a nut at the end. This when screwed up brings the lever neck into a state of tension, and the frame to which it is fastened into a state of compression—thus giving increased strength to both these portions of the plough. When more or less inclination or pitch is required for the share, the end nut is simply loosened, and the lever moved into the higher or lower grooves. The frame or body to which the lever neck is fixed is formed, so as to stand the roughest usage, and the neck is so completely boxed in, that it is protected from wear, by being kept from contact with the ground. This portion of the plough has hitherto been subject to breakage; but owing to these improvements, it appears that, although upwards of two thousand have been sold since the Warwick meeting, not a single fracture has occurred. The socket of the share is made perfectly flat and smooth on the under-side. This not only prevents the share bursting, but causes the plough to run evenly on its sole. The best form of iron for plough beams has for many years been another debated point with ploughmakers. After many forms have been tried nearly all the English makers have come back to beams made of ordinary flat bar iron. Such, however, although cheap and simple, have this defect, that in hard work they spring, and frequently get twisted. To remedy this the Messrs. Howard form their beams at the hinder part—where of course there is the greatest strain, both laterally and vertically—of bar iron, made with a double flange or rib on the upper edge. This flange or rib is tapered off at its opposite ends, so that the utmost strength is obtained with the least possible weight. The handles and beam are made throughout in a piece from the solid iron, excepting when required to be packed for exportation. This plan effectually prevents their shaking loose, and by thus raising both handles to the same height as the beam, the accumulation of soil at the hinder part of the plough in dirty weather is avoided. The wheels are fixed to the beam in a most secure and durable manner. The slides being tightened endwise, or in the direction of the length of the beam, all chance of their becoming loose through wear is removed. Either wheel can be altered as to depth or width independently of the other. The coulter is fastened by a simple wrought-iron clip, with strong loop screws, and being made to slide on the beam, the angle of the coulter can be altered as required. Indeed, any adjustment can be made almost instantaneously. One great aim has been to free every portion of the plough from complication, and to fit each part in such a simple manner that an ordinary ploughman may be able to replace anything subject to wear or breakage when in the field, without difficulty. In a word, the success of the Champion Plough has been achieved by the continual observance of these three great principles — practical perfection of design, excellence of material and workmanship, and simplicity of construction.

The first iron wheel-plough, somewhat after this fashioning, was exhibited by Mr. Howard at the Cambridge Meeting of the Royal Agricultural Society in 1840. But it was years before other makers could be induced to take to the iron work, and the Bedford plough had to contend against an amount of prejudice by this time pretty well worn out. A plough is now made at the Britannia manufactory at the rate of one in every ten minutes, and more than fifty thousand have been sold since the Great Exhibition in 'Fifty-one. The Prize Lists of the West of England Society tell to where some of these have been addressed. The Royal Agricultural Improvement Society of Ireland has given others of them a welcome; while the *Journal* of the Highland Society narrates how at Berwick in 'Fifty-four, and again in Edinburgh at the remarkable meeting of last summer, even Scotch clanship and prejudice had to bow before the English "Champion." In fact, there is scarcly now a district in England, Scotland, Ireland, or Wales but into which the Bedford plough has literally penetrated. And there is scarcely a surer sign of the advance of civilization than that bit of light blue shadowed, as an artist would say, under a hedge-row, or travelling merrily down the furrow at the tails of two smart-stepping easy-going horses. Then, the far distant colonies of Australia and New Zealand take up the echo of its usefulness, and get more and more clamorous in their calls for it. The Cape farmers have it in every-day comparison with its American rivals, while the whole Continent of Europe scarcely knows any English invention better than the Bedford plough. France, Russia, and Austria have long had it in work. A gold medal of honour from the Paris Agricultural Exhibition in 1855 found a home in Bedfordshire, and another gold medal from the same famous capital in 1856. A third gold medal was claimed at Vienna in 1857, and the Grand Diploma awarded during the same year on the occasion of the Great Hungarian Meeting at Pesth. To attempt anything like an enumeration of the prizes taken by the Howards' plough in this country would involve an almost endless iteration that is fortunately not necessary.

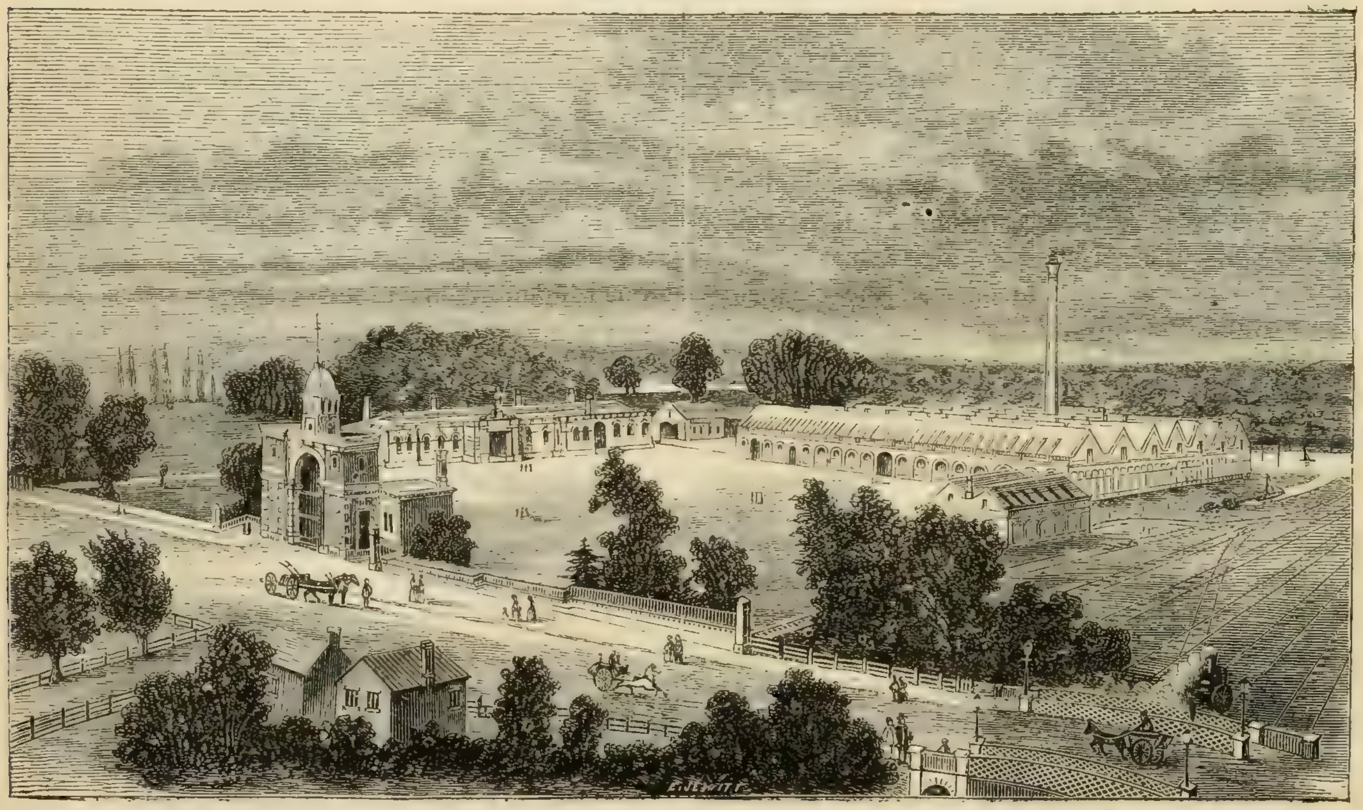
In the year 1842, entire attention having been directed so far to perfecting the plough, the Messrs. Howards commenced the manufacture of harrows. Their success here has been equally signal, and they may be fairly said to have revolutionized the notions of making a harrow quite as much as they have done those of a plough. They have at present by far the greatest trade in this implement, and deservedly so, too. At the two last trials of the Royal Agricultural Society, at Chelmsford, in 1856, and at Warwick in 1859, the Firm took the first premiums for harrows in every class. The only other agricultural implement the Howards have been sending out is the horse rake, and for this they are as much distinguished. There is no House can compare with them for the orders they execute; and since the Royal meeting at Lewes, in 1852, their rake has never been beaten. Still, to be prepared when "the doom of the plough" does come, they have lately taken up Smith's Woolston Cultivator, and with hourly increasing credit for the manner in which they turn it out. Since the year 1850, the Howard Patents have included five for improvments in ploughs, others for horse rakes and harrows, one for an improvement in this steam tillage apparatus, another for a mode of chilling and hardening cast-iron, as well as one for a system of making moulds for castings.

In 1850 Mr. John Howard, the founder of the Firm, after having ably done his duty by it, withdrew from the business. This, however, was rather from a feeling that he left its further development in safe hands than from any physical decay, or want of energy on his own part. Even now, although approaching seventy years of age, he evinces great activity of mind and body. Indeed he fulfilled the office of Mayor so ably in the preceding year, that he has now again been elected to the same high distinction in his native town. Singularly enough, it is now just a hundred years since one of his ancestors filled the chief magistrate's chair at Bedford. Whatever promise the father may have made for his sons, he has lived to see realized. The elder of the two at present in the House—Mr. James Howard—had of course, for some time previous to his occupying this position, taken a very active and leading part in its management, and in the extension of its trade. As the subject of our portrait—and a very striking one it will be admitted to be—we must say a word or two more upon this gentleman's career. He was, then, born at Bedford, in October, 1821, and educated at the Commercial Schools, so famous for the many advantages they offer to those enabled to avail themselves of the Harper Foundation.

Having learnt all they could teach him here, he left at a comparatively early age, and went at once into the plough trade. He quickly saw the extensive field that was opening before them, and commenced working upon it with characteristic energy and determination. The limits of the Bedfordshire plough rapidly extended, and young Howard was to be seen in attendance on it at nearly every meeting of importance. The first Show of the Royal Society that he attended was at Liverpool, in 1841; when, although not twenty years of age, he himself held the plough and took the first prize of his class on Aintree race-course. He again went to work as the practical man on Coombe Down, Bristol, the following year, and again divided the honours as the best ploughman with the best plough. Since then he has never missed a meeting of *the* Society; while he turns up in the West Countree, at Carlow in Ireland, Berwick on the Border, and all sorts of far-away places, with the same pleasant, winning look, and good story of "what these fellows think of us." It is scarcely necessary to dwell on a history that is so thoroughly identified with that of his House. In fact, Mr. James Howard is the representative-man. While his brother Frederick, by some years his junior, is working up accounts which are pronounced to be a model of excellence and financial arrangement, the other is "all over the country." As a consequence, he has come to be recognised accordingly. Mr. James Howard has been twice elected a member of the Council of the Royal Agricultural Society, upon which he still sits. Three times has he been put in again as one of the Committee of the Central Farmers' Club; and where he continues to act. For the second time in succession he was, during the last Smithfield Show week, selected as a Vice-president of the Association of Agricultural Engineers. His qualifications for all these offices are well known, but we must yet add to the list. As the inventor of a clever moulding machine, fast coming into general use, and that has done much to supersede the tedious employment of skilled labour, he has been lately enrolled as a member of the Institution of Mechanical Engineers—a grateful compliment honestly deserved. Tracing him nearer home—a *finer* proof, perhaps, of a man's real worth—he is a member of the Town Council of Bedford, a Director of the projected extension line of the London and North-Western Railway between Bedford and Cambridge, and one of the most active of the founders of the Bedford Working Man's Institute. A lieutenancy in the Rifle Corps now forming may go to complete the public distinctions and appointments of Mr. James Howard; and as a proof of the heartiness with which he takes anything up, it may be mentioned that he will proceed to Hythe for "practice". Into the more sacred duties of a husband and a father we do not care to travel. But as a weak point in his character, justice compels us to add that he has not been able to resist the temptations of authorship. Having once been directly referred to, he had to admit himself to be the writer of the pamphlet on "The Manufacture of Agricultural Machinery Considered as a Branch of National Industry"; the declared object of which was the abolition of the prize system. The argument here is well and closely put, and the style has both force and simplicity to recommend it; but the deduction is one to which Mr. Howard's own success is, surely, a contradiction! Still, his brother manufacturers considered it very nicely done; and really, if the point had been but the right way, we might have thought so too.

It may well be imagined that the premises at the "Barley Mow" gradually became quite unequal to the growing trade in the Bedford ploughs, and every available space that could be converted into a workshop was successively secured. Some two or three years since it made out quite a morning's walk to call round at the different works. In this hour of need the services of a rising young architect—Mr. Robert Palgrave, of Pall Mall, but himself the son of a Bedford townsman—were called in, and the present handsome, extensive, and beautifully-planned block of buildings determined upon. A most convenient site was selected. On the north the grounds run right down to the Ouse—a river navigable to the ports of Wisbeach and Lynn. On the south the chief entrance to the Works opens appropriately enough on the road to Woburn, so famous for its agricultural gatherings in the time of another Duke of Bedford, and still deservedly known for a good landlord and an enlightened tenantry. But it is from their eastern aspect that the Britannia Works will be most familiar to the traveller. He journeys now little, either by road or river, and the line of the Midland Railway comes close under the great plough-manufactory, while the London and North Western is almost as handy; both having branch lines into the Works. The whole range of buildings occupy a space of some fifteen acres; and their erection, including the purchase of the land they stand on, has been made at an outlay of about five-and-twenty thousand pounds. They are probably, as now just completed, the largest works in the world devoted to the manufacture of field implements, and one shop alone occupies an acre of ground. The general arrangement and construction have been pronounced to be admirable, and Mr. Palgrave has evinced a degree of taste and skill in appropriate embellishment that adds materially to the effect. It is really a most handsome pile, and as fine an advertisement for either owners or designer as could have been hit upon. No man with his eyes open can pass without inquiring "what place is that?" While, in answer, some communicative countryman is sure to dilate on "the immense business—thousands on thousands of ploughs they turn out in a year"—"sent all the world over"—"very clever fellows those Howards of Bedford"—and so on. Subjoined is a bird's eye view of one of the sights on the midland line, so that "any one going on" will know what to look out for, after he has come through Cardington Field.

Still to appreciate them properly he should get out at the adjoining station, and spend a few hours in looking over the Works. Ornament and effect are merely subsidiary points, after all. Economy of labour, convenience of construction, and the most perfect observance of order and classification, have been the great things the architect has had to aim at. A tramway runs completely round the whole range of Works, and through every shop, with a turn-table in the centre of each. The coal and fuel when landed at the wharf are thus carried up to and weighed out to every workman, by others exclusively employed for this purpose. The wrought-iron is delivered from the railway by similar means, and cut off by steam-power to the several lengths required. The same system is adopted with everything else in use here, no man being suffered to leave his work, but being continually "fed" from the stores. As is the plan in a few of the large modern cotton mills, the raw material passes through a succession of hands to gradual completion, and at least a hundred and twenty different men have their allotted bits and parts in the make of a single plough. Wherever it is at all available, the aid of machinery has been called in, and devoted to an infinity of purposes, from the raising of the iron into the furnaces, down even to the grinding of that standing colour, the blue paint. Nearly all this machinery is cotemporary with the date of the building it is fixed in, scarcely any of that previously in use having been transplanted.



R Palgrave, Pall Mall, Architect.

THE BRITTANIA WORKS, BEDFORD.

The rule of the House is Piece-work. The metal is melted, the ploughs painted, and the very goods packed by this system of measurement. "The Forwarding Department" is in itself a kind of railway station, and one far more complete and methodical in its management than many of these are. The great and indispensable feature in working by the piece is the absolute necessity for continual supervision, and in addition to a number of able overseers "Mister Fred," is seldom off the premises. His brother we should say has appeared as a lecturer at well as an author. Soon after the opening of the Institute he delivered an address to the members on "Labour and Wages," which was so well received that he was requested to repeat it during the past year to the somewhat disaffected artificers of Northampton. The second hearing was quite as successful, and from this we borrow a word on the way that labour and wages go together in the Britannia Works:—"I like the system of piece-work, as it enables the workmen to earn higher wages, and the master pays for no more and no less than is done. I never had any difficulty in letting a job by the piece. I hear there are difficulties in other trades, but I think they would vanish when the system came into operation; 'tis worthy of remark and consideration, that those trades have made the greatest progrees where piece-work has been the rule. It gives the industrious and skilful man a great advantage over the lazy and unskilful one. It also sets the energies of mind to work to find out readier and quicker methods of getting over work. I have no time to enter on overtime: it may do with your slow day-workmen, but 'tis of no advantage to men by the piece. I have had a somewhat extensive experience, and have invariably found the result of overtime, continued for any length of time, to be a large number of men on the sick-list. I believe, if men work well ten hours a-day, they will do more in a year than if worked twelve hours."

An employer can be hardly better engaged than in offering a word in season to the working-man. And whether it be Lord Palmerston closing the year at Romsey, or Mr. James Howard opening it at Northampton, either is alike to be commended for the sound advice and right tone of what he said. Let us leave the hero of our history in good company.

THE EARLY ENGLISH AGRICULTURAL AUTHORS.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

In a recent number of this valuable magazine I endeavoured to trace some of the earliest-written laws relating to the agriculture of our country from old British days to the time of Henry VIII. It was in that reign that the first two works on English farming were printed. These were the treatises of Bishop Grotehead (or Greathead) and of Sir Anthony Fitzherbert. To these very curious little works I propose in this paper to direct my readers' attention.

It will be well, however, if we first briefly pause to remember what kind of tenantry—what sized farms were held by the husbandmen to whom those two learned authors addressed themselves. As I have on a previous occasion remarked, when alluding to the early notices of English farming, the native Britons, it is very certain, appropriated but small portions of the land for raising corn, or other cultivated vegetables, and the rest of the country was left entirely open, affording a common pasturage for their cattle, and *pannage* for their swine. Under the Roman governmer the extent of cultivated ground must have considerably increased; yet the oldest writers agree that by far the greatest proportion of the country was occupied by heaths, woods, and other unreclaimed wastes.

When the Saxons established themselves in the island, an almost total revolution in the proprietorship of the lands must have occurred. The conquest was only accomplished after a bloody struggle; and what was won by the sword was considered to possess an equitable title that the sword alone could disturb. In those days it was supposed that the lands of a country all belonged to the king; and on this principle the Saxon monarchs gave to their followers whatever districts they pleased, as rewards for the assistance afforded in the conquest, reserving to themselves large portions, and imposing certain burdens upon each estate granted (*Coke's Littleton,* 1, 58, 2; *Blackstone's Comm.,* 45, &c.). This was only a continuance of that feudal system that prevailed upon the continent; and we may take the county of Sussex as an example how the land was carved out among the aristocracy in the days of our Norman kings, reckoning a *hide* at 100 or 150 acres:—

	HIDES.
The king had	59½
Archbishop of Canterbury	214
Bishop of Chichester	184
Abbot of Westminster	7
Abbot of Fecamp	135
Bishop Osborn..	149
Abbot of St. Peter's, Winchester ..	33
Church of Battle	60½
Comes of Oro	196¼
Comes Roger	818
William of Braiose	452¼
Abbot of St. Edward	21
Comes Moriton..	520
William of Warrene..	620¼
Odo and Eldred	10

These great proprietors granted the chief part of their estates to the actual cultivators of the soil, receiving in general from the under-tenants certain proportions of whatever might be the productions of the farms. Thus we find one tenant stating, "I give food to seventy swine in that woody allotment called Wulfeudinleh, and five waggons-full of good twigs; and every year an oak for building, and others for necessary fires, and sufficient wood for burning" (*Bede, Hist. Append.*, 970). The rent of ten hides of land were even regulated by two of the laws of King Ina. They enacted that the tenant of such extent of land should render to the lord ten vessels of honey, three hundred loaves, twelve casks of Welsh ale, thirty of clear ale, two old rams, ten wethers, ten geese, twenty hens, ten cheeses, one cask of butter, five salmon, twenty-pounds' weight of fodder, and one hundred eels; or else ten mittas of malt, five of grits, ten of wheat flour, eight gammons, sixteen cheeses, two fat cows, and in Lent eight salmon (*Wilkins, Leges Saxon*, 25, 3; *Gale's Hist. R.*, 410). Such grants were usually to the tenant and his heirs for ever, so long as they afforded the accustomed rent; and I am not aware of any grant or lease extending for a shorter period than the life of the tenant. An example of these occurs in the year 852, when the abbot and monks of Medehamsted let some land at Sempingham to a tenant named Wulfred, for his life, on condition that he annually paid them sixty fother of wood, twelve fother of *græfan* (coals), six fother of turf, two tons of clear ale, two killed oxen, six hundred loaves, ten casks of Welsh ale, one horse, thirty shillings, and a night's lodging (*Saxon Chronicle*, 75).

As this feudal system declined, and was finally extinguished in the twelfth year of Charles II., so proportionally did the landed interest increase in prosperity. Freed from the burden of furnishing a soldier and his armour for every certain number of acres, and all restrictions as to land changing hands being removed, and the numerous impositions being got rid of, with which the lords oppressed their sub-infeudatories, it soon became a marketable species of property; and, as money and merchandise increased, and the proprietor lived less upon his estate, it soon became the most eligible plan for both landlord and tenant, that the whole rent should be paid in money.

Of the size of these early farms we have no precise information; but from the laws of Ina we may perhaps conclude that a hide of land, equal to about 100 or 120 acres, was the customary size; for, in speaking of the produce to be given to the lord for ten hides, the law speaks of the smallest division of each county of which it was particularly cognizant; namely, of ten families, or a tithing, as they were collectively called. Again, Bede expressly calls a hide of land familia, and says it was sufficient to support a family. It was otherwise called mansum, or manerium, and was considered to be so much as one could cultivate in a year. (*Henry of Huntingdon*, vi. 2,066.)

That in the time of Henry VIII. rents were payable in money, we have the evidence amongst others of Bishop Latimer. He flourished in the early part of the sixteenth century, and his father was amongst the most respectable yeomen of his time, yet his farm probably did not much exceed one hundred acres. He observes in one of his sermons, "My father was a yeoman, and had no lands of his own; he had only a farm of £3 or £4 a-year at the utmost, and hereupon he tilled as much as kept half a dozen men. He had a walk for one hundred sheep, and my mother milked thirty kine."—(*Sermons p.* 30.)

It is evident, from the constant reference to woods in these husbandry notices, how valuable they must have been in those days for fuel, since pit-coal was not then extensively available. Their value of course increased towards the northern portion of our island, so that we find the Scottish Parliament directing the planting of timber trees.

In 1503 (the 6th of James IV. of Scotland) it was ordered "that everith Lord or Laird make them to have Parkes with Deare, Stankes, Cuningares, Dowcattes, Orchards, Hedges, and plant at the least ane Aicker of Wood, quhair there is na greate Wooddes nor Forrestes."

Other acts of a similar kind, for the promotion of the growth of timber, had been previously made; and again in 1535.

The clergy and the rural life of those days seem to have had little reverence for God's house or God's acre; for in the same year it was ordered by the Parliament that "nor Faires be halden upon Halie days, nor zit within Kirkes nor Kirkezairdes upon Halie daies nor uther daies."

Such were the primitive habits and modes of cultivation, down to the time of the two old agricultural authors, whose works I now propose to describe.

Sir Anthony Fitzherbert, as I have in another place remarked (*Quar. Jour. Ag.*, vol. ii., p. 491), was the youngest son of Ralph Fitzherbert, of Norbury, in Derbyshire. He was educated at Oxford; and when called to the bar by the Honourable Society of Gray's Inn, "his great parts, penetrating judgment, and incomparable diligence," says his biographer, "soon distinguished him in his profession." He was made a serjeant-at-law in 1511, and was knighted five years afterwards. In 1523 he became one of the Justices of the Court of Common Pleas, in which year he published, it is supposed, his "Boke of Husbandrie;" for a copy was possessed by the late Mr. Heber, bearing that date, "imprynted by Rycharde Pynson."

Fitzherbert's biographer adds, truly enough, that "he was held the oracle of law in his time." He evidently possessed the most undoubted courage and the most uncompromising integrity. He was one of the very few who dared to oppose Cardinal Wolsey in the height of his power. On his death-bed, at a period when almost all were eagerly scrambling for the spoils of the Church of Rome, he solemnly warned his children on no account to accept of any of the sequestered property of the abbeys.

To this injunction his descendants inflexibly adhered. They have often been honourably distinguished in the ranks of literature and in the public service of their country. The family was ennobled in 1801, when Alleyne Fitzherbert was created Lord St. Helens.

Sir Anthony Fitzherbert died on the 28th of

May, 1538, and lies buried in his own parish church of Norbury, where, on his gravestone of blue marble, was long to be seen the following short and modest inscription :

"Of your charitie, pray for the Soule of Sir Anthony Fitzherbert, Knyght, one of the King's Justices of his Common Bench, and sometime Lo. and patron of this Towne, and Dorothy his Wife, daughter of Sir Henry Willoughby, Knyght, &c., which Sir Anthony deceased 27 May, 1538."

Of his great law works, by which he is so well and so honourably known to the law-student, this is hardly the place to describe. His "Natura Brevium," and his grand "Abridgment of the Laws," the great Sir Edward Coke has well described, when he is speaking, in his preface to his Eighth Report, of the first-named, and of the last says, "it is an exact work, and exquisitely penned" (Preface to Tenth Report).

In the Library of the British Museum will be found a small duodecimo volume entitled "The Boke of Husbandry," by Sir Anthony Fitzherbert, published in 1534; and this is certainly the earliest extant work on husbandry, that professes to be *written* by an Englishman.

It commences by saying, "Here begynneth the Boke of Husbandry, and fyrste whereby husbandemen do lyve."

An early section is of "dyvers maner of plowes."

It is evident from this that, even in those days, there were different kinds of ploughs used in various parts of England; for, as our author remarks, "One plowe will not serve in all places; wherefore it is necessary to have dyvers sortes. In Somersetshire, Dorsetshire, and Gloucestershire, the share beam, that in many places is called the plow head, is four or fyve foote longe, made very broad and thinne; and that is because the lande is very toughe, and would sucke the plowe into the earth, if the share beams were not very longe, broade, and thynne. In Kent they alter muche in fashyon; for there theye goe upon wheeles, as they do in some parts of Hartfordshire, Sussexe, and Cornewalle. But," adds Fitzherbert, very wisely, "neyther wyll I stand too stryctly on theyr fashyon, sythe theyr is no countye but custome or experyence hath instructed them to make choyce of what is avaylable; and he that wyll lyve in any countrye may by free charter learne of hys neighbours, and howsoever any plowe be made or fashyoned, so it be well tempered, it may the better be suffered."

Sir Anthony, like Bishop Greathead, was a decided advocate for the use on heavy soils of oxen in husbandry. He had evidently thought much on the subject. It is curious to see how closely the arguments on the subject by a farmer 340 years since, resembled those of modern agriculturists. At the conclusion of a section devoted to the subject, he remarked: "If any sorance betyde a horse, as old age, bruysyings, blyndness or lameness, then is he worth nothynge except for a kennell of noyse-begettyng hounds (we might suspect from this remark, that the learned judge was no friend to the delights of the chase). But if myschief befall an ox, for ten shyllyngs at any tyme he may be fed, and then he is man's meate, and in that degree better than ever he was. These reasons and circumstances considered, I am of the poet's opynyon, that the plowe of oxen is much more profytable than the plowe of horses, to whych the Holy Scryptures themselves condescend; for wheresoever it speaketh of husbandrye, it only sayth the oxe to hys yoke for labour."

After telling the farmers of his time how they should plough different kinds of land "all tymes of the yeeare," he then proceeds in a natural order of arranging his work, to seed sowing. He commences with a seed, which should be mingled, in fact, with all other kinds, and which he thus describes: "There is a seed called dyscretyon, if a husbandman have of that seede, and myngle it amonge hys other corne, they wyll grow doubtless much the better." And he adds: "Thys seede of dyscretyon has a wondrous vyrtue, for the more it is eyther taken of or lent, the more it is."

To Sowe Barley is the title of a section at p. 10. It seems that in those days there were "thre manner of barleys, that is to say: spot barleye; longe eare; and bere barley, that some menne call bigge."

"To Sowe Otes" is the next title of a section. Our author says of this crop, "It is to be knowen that there be III. manner of otes, that is to saye: redde otes, black otes, and roughe oats. Redde otes are the best otes, and verye good to make otemele of." Black oats he deemed inferior to the red, and he adds, "the roughe otes be the worst: they be very lyghte, and have long tayles, whereby they wyll hange eche one to other."

He goes on to say, "all these manner of otes weare the grounde very sore, and maketh it to bear quyche."

He leaves the quantity of seed oats to the farmer; "his wysedome and discretion muste discerne it."

He proceeds to treat of how "to harowe all manner of corne." The ploughing of those days was evidently ill done, and the harrows heavy and rudely constructed. Fitzherbert remarks, "it is a great labour and payne to the oxen to goo to harrowe, for they were better to goo to the plowe two dayes than to harrowe one daye. It is an old sayinge

The ox is never woo,
Tyll he to the harrowe goo.

It is because it goeth by twytches and not alway after one draughte."

It seems from what he says in his chapter "howe forkes and rakes should be made (p. 19), that the husbandmen of that time made their own."

When he speaks of haymaking, p. 20, he truly enough remarks, "good teddynge is the chiefe poynte to make good hey."

Of artificial manures, they were evidently in those times not altogether unacquainted, for Fitzherbert in his chapter of "how to make barrayne grounde brynge forth good corne," recommends the mingling of saltpetre, dregs of oil, and pigeons' dung with the seed.

Then he has a chapter on "howe to carrye out manure or dunge, and howe to spreade the same." He advised his brother-farmers that it should be "layed up in small heaps neere together;" "to spreede it evenlye;" to leave none where "the greate heepe stoode," and not to let the heaps stand too long, lest if they took a shower of rain the goodness of the manure should "runne into the grounde where the heape standes, and the rest when it is spreade wyll lyttle profyt." He also recommends the use of "marle."

Another of the books into which the work was divided, is devoted to the "breedyng, oderyng, and usage of cattell by the whatsoever els appertaynes to theme, aad fyrst of sheepe." In this, when speaking of "what thynges rottethe sheepe," he gives a list of things, such as "the grasse called spear-woorte," and another called "penny-grasse," and also "all manner of grasse that the lande floode runneth over;" all "marrishe grounde and marshe groundes, salt-mashes only excepted." And then he adds, "hunger rotte is the worst rotte that can be."

It is ever noticeable that in all barbarous countries, and even in those approaching towards civilization, to the women is assigned labours for which men are better adapted. It is more especially so in the warmer climates of our globe; but even in northern England, in Fitzherbert's book, we find the following grave assignment of hard duties to a farmer's wife of the time of Henry VIII.—

"It is the wyfe's occupatyon to wynnow all manner of corne, to make malt, to wash and wringe, to make haye, to sheere corne, and, in tyme of needs, to help her husbande to fyll the muck-wayne or dunge-cart; to dryve the plowe, to loade corne, &c.; to go or ryde to the market, to sell butter, mylk, cheese, pygges, and all manner of corn," &c.

After describing the sundry duties of the wife in attending the market, our author goes on to remark—

"And also to bye all manner of necessarye thynges belongynge to householde, and to make a trewe rekenynge and a compte to her busbande what she hath receyed and what she hath payed; and if the husbande go to the market to bye or sell, as they ofte do, he then to shewe his wyfe in lyke manner. For if one of them shoulde use to deceyve the other he deceyveth hymselfe, and he is not lyke to thryve, and therefore they must be trewe eyther to other. I could, peradventure, shewe the husbandes dyvers poynts that the wyves deceyve them in, and in lyke manner howe husbandes deceyve theyr wyves; but if I shulde do so, I shulde shewe more subtyll poyntes of deceyt than either of them knewe of before, and therefore me semeth beste to holde my peace."

The "Thyrde Boke" of husbandry is upon planting timber trees, of which he was evidently enlightened enough to perceive the private and national advantages. Then there is added to the work sundry domestic matters, which Fitzherbert most probably never intended to appear in a book of husbandry—such as the sections on the use of the cinnamon, cloves, pepper, and other spices —receipts for "a balme," and "an approved receyte for the gowte."

His "Fourthe Booke" is still more of a domestic nature, "contaynyng the orderying of an householde." In this he is particular in his directions how the men-servants should be kept in order and honest, for he had evidently a strong suspicion that in those days they were roguishly inclined. Then he proceeds to give directions for breeding all kinds of poultry—how many eggs should "be sette under your henne," and says the number should "be odde," either a "fyfteene or nyneteene," according to the season; and then he has several other little sections on similar subjects, and so rarely makes a mistake in his common-sense observations, that we are the more amused when he tells us very gravely, when speaking of swans, that "when they waxe olde they do declare the tyme of theyr owne death to be neere approachyng by a sweete and lamentable note whych they then syng."

Towards the close of this book, Fitzherbert has sundry chapters full of quotations from the holy fathers regarding pleasing God, almsgiving, prayer, &c. Living however, as he did, in very ticklish Protestant and Popish days, when heresy was treated in a very summary and fierry manner, he thought it well to add—

"I make protestation before God and man that I intende not to wryte anythinge that is or may be contrary to the fayth of Cryste and of Holy Church; but I am redye to revoke my sayinge if anythinge have passed my mouthe for want of lernynge, and to submytte myself to correction, and my boke to reformatyon."

"Go lythell quere, and recommende me
To all that this treatyse shall se, here, or rede;
Prayenge them therewith content to be,
And to amende it in places where, as is nede,
Of eloquence they may perceyve I want the sede.
And rethoryke in me doth not abounde,
Wherefore I have sowe such sedes as I foud."

At page 91, Fitzherbert thus concluded his book—

"Thus endeth this ryght profytable boke of husbandry, compyled sometyme by Mayster Fitzherbarde of charytie and good zele that he bare to the weale of this mooste noble realme, whyche he dydde not in his youthe, but after he had exercysed husbandry with great experyence xl. years.

"Imprynted at London, in Flete-streete, in the house of Thomas Berthelet, nere to the condite, at the synge of Lucrece. Cum privilegio."

In the same volume of the British Museum Library is also bound up another work of Fitzherbert's entitled, "Surveyinge, A.D. 1539."

The work of Bishop Grotehede, or Greathead, disputes with the Boke of Fitzherbert the merit of being the first English treatise on agriculture. The claims of both these interesting works have been, on a recent occasion, too fairly and clearly stated by the editors of the "Cottage Gardener" to need any other description ("Cottage Gardener," vol. xxxii., p. 52).

After alluding to the edition of Fitzherbert printed in 1523 by Richard Pynson, they add—

There is as early, if not an earlier, work, however, even than that of Fitzherbert's. It is entitled as follows:—

"Here begynneth a tratyse of Husbandry which Mayster Groshede, sometyme byshop of Lyncoln, made and translated it out of Frenshe into Englyshe, which techeth all manner of men to governe theyr londes, tenements, and demenes, ordinatly as in the chapytres evidently is shewed."

Now, whether or not this "tratyse" was written by "Master Groshede," it is quite certain that it was printed by Wynkn de Worde, who was Pynson's contemporary, their earliest books being printed in the same year, 1493, and they continued rivals and publishing the same books until the date of Wynkyn de Worde's death in 1534. A few instances may be quoted. De Worde published *Mons. Perfectionis* in 1497, and Pynson did so the same year; Pynson published *Diues and Pauper*, in 1493, and De Worde issued it in 1496; De Worde brought out *The Siege of Troy* in 1503, as did Pynson in 1513. That Wynkyn de Worde did print the "tratyse" is proved by the copy, the only one known to exist, in the University Library at Cambridge. It has his monogram, and is, beyond a doubt, from the same sharp, broad-faced old English type, and of the same black, unbrowned ink as gave birth to other acknowledged works from his press. It is without a date; but either it was published as a rival to Fitzherbert's "Boke," or this "Boke" was published to oppose Grosseteste's "Tratyse."

It is a small quarto of twelve leaves. On the first page is a woodcut representing a steward or other party of authority, who, with hands outstretched in astonishment, is reprehending a woodman, who certainly needed the reproof, for he is cutting off the top of a tree by the blows of an axe, which have made a ruinous gap half-way up the trunk.

As it certain that it was printed by Wynkyn de Worde, so is it equally beyond a doubt that it treats of English husbandry. Groshede may have first "made" it it in French, and then "translated it out out of Frenshe into Englyshe," but still the truth is apparent that it is written concerning English husbandry, all the measures are English, and so are all the attendant particulars. The best evidences of this that can be placed before our readers are the following extracts:—

The first is what we should now call a "Table of Contents"—

"The i chapytre telleth how ye shall spende your good and extende your londes.

"The ii chapytre telleth how youre londe shall be mesured, and how many perches maketh an acre, and how many acres maketh a yerde of londe, and how many yerdes maketh an hyde of londe, and how many hydes maketh a knyghtes fee.

"The iii chapytre telleth how many acres of londe yt a plough may tele in a yere.

"The iiii chapytre telleth a plough of oxen or a plough of hors may tele more londe in a yere and whiche is more costly.

"The v chapytre telleth in what season ye shall begynne to falowe all maner of londes.

"The vi chapytre telleth how ye shall lay youre londe at sede tyme.

"The vii chapytre telleth how your londe shall be sowne in all seasons.

"The viii chapytre telleth how ye shall chaunge your sede and nourysshe your stubble.

"The ix chapytre telleth how ye shall nourysshe your dounge and wede your corne, and how it shall be mesured out of the barne, and how moche an acre shall yelde agayn more than your sede yt ye sholde have wynnynge therby.

"The x chapytre telleth how ye shall chaunge all maner of catell in season.

"The xi chapytre telleth how ye shall chañge youre werke bestes and wene youre calves, and what prouffyte ye shall have of youre kyne, and vayll to butter and chese.

"The xii chapytre telleth howe ye sholde nourysshe youre swyne and youre pygges.

"The xiii chapytre telleth howe ye shal nourysshe your shepe and dyvers medycynes for theym.

"The xiiii chapytre telleth what profytes ye shal have of youre ghees and hennes.

"The xv. chapytre telleth how ye shall by and selle and preve youre weyghtes.

"The xvi chapytre telleth how ye shall take a compte of youre balyf ones a yere."

Of these "Chapytres" I will republish four:—

"The ii chapytre.

"It is to wete that thre barly cornes take oute of ye myddes of the eer maketh an ynche, and xii ynches maketh a fote. And xvi fote and an halfe maketh a perche, and xl perches in length and iiii in brede maketh an acre of londe, and iiii (acres) maketh a yerde of londe, and v yerdes maketh an hyde of londe, and vii hydes maketh a knyghtes fee.

"The iii chapytre.

"Some men say yt a plough may not tele viii score or ix score acres of londe a yere. But I shall prove it by good reason yt a plough may do it. For ye shall understonde than an acre of londe is in mesure xl perches in lengthe and iiii in brede, and the mesure of a perche is xvi fote and an halfe. And so ye brede of an acre of londe is xlvi fote, and so ye go with youre plough xxxiii tymes up and doune the londe and se the fyrst forowe be a fote and eche of the other be in lyke qantyte and then is an acre ered. And whan the forowe is as strayte as it may be than is it xxxvi tymes up and doune the londe though it be a large acre. And the plough be never so feble attemost ye have gone but lxxii tymes up and doune ye londe, which is but v myle way. Now truly the hors or oxe is feble that from the morowe maye not go softely iii myle from home and come agayn by none. And by this other reason ye undstonde that there be lii wekes in the yere, take viii wekes for holy days and other lettynges and there remaneth behynde xliiii to werke in the se xliiii wekes ben cclx dayes besyde Sondayes. Also a plough shall ere thryes in the yere | yt is to say in the wynter, in lenten, and in leke sede time. In wynter a plough shall ere iii rodes and a halfe a daye. And on eche other season an acre on the day at the lest. Now knowe ye whether it maye be done or not, but by cause ploughmen carters and other fayne and werke not truly. It is behovefull yt men fynde a remedy agaynst theyr servauntes. And therefore it is necessary that the balyf or some of the lordes offycers be with them the fyrste daye of doynge folowynge and sowynge to se yf they do theyr werkes truly, & let theym answer you as moch werke as they dyde the fyrste day. Also it is necessarye that youre balyf overse youre werke men ones in a daye to wete yf they do theyr werke truly as they ought to do, and yf ye fynde theym contrary he shall chastyse theym reasonable therefore, and by dyscrecyon, &c.

"The iiii chapytre.

"The plough of oxen is better than the plough of hors, but, yf it be upon stony grounde yt whiche greveth sore the oxen in theyr fete. And yt plough of hors is more cosily than ye plough of oxen & yet shal your plough of oxen doo as moch werke in a yere as youre plough of hors, though ye dryve your hors faster than ye do your oxen, yet in what groñde so ever it be youre plough of oxen, yf ye tele your londe wel and evenly, they shal do as moche werke one daye with a nother as your plough of hors, yf the groñde be tough your oxen shall werke where youre hors shall stande styll. And yf ye will knowe how moche the one is costlyer than ye other I shal teche you. It is a costume yt bestes yt go to the plough shall werke from ye feste of Saynt Luke unto the feste of Saynt Elene in Maye, that is to saye xxv weekes, and yf youre hors sholde be kepte in a good plyght to werke he must haue dayly the syxt parte of a bushel of otes pryce ob. [*obolus,* a farthing] and in gresse in somer season xii d. And every weke that he standeth at drye mete one with another ob. in strawe for lytter. And in shoynge as often as he is shodde on all foure fete iiii d. at the lest. The somme of his expenses in the yere is ix s. vi d. ob., besyde hay and chafe and other thynges. And as for the oxe ye may kepe hym in good plyght dayly to doo his journey gyuynge hym euery weke thre oten sheves pryce i d. by cause x oten sheves yelde a bushell of otes yf they be made by the extent and in somer season xii d. in gresse. The somme of his expenses by the yere is iii s. i d. be syde strawe and chafe. And yf a hors be overset and brought downe with labour it is adventure & ever he recover it. And yf your oxe be oversette and brought doune with labour ye shall for xii d. in somer season have hym so pastured that he shal be stronge ynough to do your werke or elles he shall be so fatte that he may selle him for as moche moneye as he coste you.

"The xiiii chapytre.

"Ghees and hennes shall be at the delyueraunce of youre baylyf or lete so ferme a goos for xii d. in a yere. Fyue hennes and a cocke for iii s. in a yere and there be some baylyfs and deyes that say nay to this prouffytes. But I shall preuve it by reason, for in halfe a yere be xxvi wekes, and in these xxvi wekes ix score dayes; and in eche of these dayes ye shall have an egge of eche henne & yt is ix score egges of eche henne in that halfe yere, it is a feble sale of egges & xxx egges be not worth a peny and yf ony of theym syt in that halfe a yere or some daye in defaute of lyenge, ye shall be recompensed there fore, and of vi more to bere out the ferme ye cocke, and wt the sale of the chekens yt youre syttynge hennes brynge forthe in that other halfe yere. Nowe shall ye se whether I say sothe or nay the pecocke shall answere as moche the for feders (feathers) as the shepe for his wolle. Every cowe shall answere you a calfe. And every moder shepe shall answere you a lambe. Every female swyne shall answere you xiii pygges at thrye farowyges at two tymes at eche tyme iii and the thyrde tyme fyve the x for tythe. Every henne shall answere you of ix soore egges or of chekens to ye value. Every goos shall answer you of vi ghoslynges And yf ony of this catell be bareyne ye balyf shall answere you of the yssue that is loste thrugh his euyll kepynge, by cause that he dyde not selle theym and put the sylver to other prouffytes to the value."

The last three or four pages are devoted to Gardening, and this portion has this commencement:—

"Here begyneth the plantynge of trees and of vynes."

It is quite unworthy of the previous part, being a mere collection of the mis-statements of the Greek and Roman writers relative to altering the colour of fruits and similar indulgences of the imagination.

It has been doubted whether Bishop Grosseteste wrote all the works of which a list is given in his life by Pegge, as well as in Tanner's *Bibliotheca Monastica.* It has been truly said that they are equal in number to those produced by any of the great Arabian Philosophers. Indeed, in one department of literature—Poetry, he surpassed them, for we have his "Chastel d'Amour" among the Harleian MSS. But, the works enumerated, and mostly remaining in MS., are generally very brief, and do not exceed, even if they equal, in number of pages, the varied works published by Fitzherbert, who, also, found time, notwithstanding his profession, to write his "Boke of Husbandry."

Let us remark, also, that this is not the only work of Grosseteste that was thought worthy of being printed so many years after his decease, for his *Treatise de Artibus Liberalibus* and his *Commentary on Aristotle* were published at Venice in 1514.

Bishop Robert Greathead, for he was an Englishman, and his real name was only foreigned by such translations as "Grosthead" and "Grosseteste," was a man of high attainments, and of a mind enlarged far above the generality of his contemporaries. He was a friend of Roger Bacon, and studied as he did the Natural Sciences. He was, says Sharon Turner, "intrepid and patriotic, foremost in every useful pursuit of his day, the friend and cultivator of poetry, scholastic philosophy, Arabian science, natural philosophy, mathematics, divinity, and canon and civil law. He was also the fearless and successful assertor of the liberties of the English Church, and a protector of the English clergy against the taxations and tyranny of the Pope."—(*Turner's Hist. of Middle Ages.*)

His letter to Pope Innocent in 1253 may be read in the Chronicle of Matthew Paris, and was so displeasing to the Pontiff, that he threatened to hurl upon him confusion and destruction. Greathead went fearlessly on to declare the Pope both a heretic and antichrist; and after death the Bishop was believed to have visited the Pope, and to have threatened and terrified him from his purpose of having the Bishop's bones dug up and thrown out of the church. The diffusion of such an idle tale implies the popularity of Bishop Greathead, and the preceding facts readily explain why the applications to Rome for canonizing him were but coldly received.—(*Wilkins' Concilia*, ii., 287.)

There is no sound reason, then, for doubting that Bishop Greathead wrote the "Tratyse of Husbandry;" and if he did, it is certainly the earliest relation we have of English Agriculture in the 13th century, for he died in 1253, at Buckden, the episcopal residence of his see, and the agriculture he describes was that of the reigns of Henry II., Richard I., John and Henry III.

It is refreshing to review works like these. They came forth as soon as printing was introduced into our island; plainly written little books for the small farmers of their time. Printing, indeed, when it first showered its blessings over other classes, did not neglect the agriculturists. It has since been the handmaid of all the sciences, all the knowledge which have gradually raised the British farmer to his present proud position. Printing—and printing only—enabled Fitzherbert and Grotehead to so well address their brother-cultivators of 1532. They were well followed by Tusser in the same century, Old Worlidge and others in the seventeenth; and Jethro Tull (the greatest benefactor to his country of them all) in 1732, exactly two centuries after the publication of the first English "Boke of Husbandrie."

THE HERDS OF GREAT BRITAIN.

CHAPTER XIII.

MR. SAMUEL WILEY'S.

Classics are disposed to back Nestor; the Midland Counties have stood up as consistently for their Naseby patriarch, who cut off the crust, and left the soft for his son; but if there was a gold medal to be awarded to vigorous old age, Yorkshire would elect to show in pairs, with 85 as the average, and nominate Sir Tatton and Mr. Wiley as their champions.

The Sledmere pastures are all alive with Daniel O'Rourkes and Riflemen; while the perennial blood-mare, which was wooed by Orvile, Tramp, Blacklock, Comus, Filho da Puta, or Margrave, as each was in turn the fashion, has quite ceased to be an institution of Brandsby: but the veterans have not severed in their taste for pure Leicesters, and are still as brisk at a tup-bargain as when they eyed each other across the Barmpton letting-ring, or journeyed in the long summer-days, with Tom Carter at their side, to Burgess's of Holme-Pierrepont and Buckley's of Normanton. On these occasions, however, they were seldom in opposition, as Sir Tatton has always liked a smaller sheep, from a belief that they are more profitable to the Wold farmers.

The venerable baronet had reached his thirteenth birthday when Mr. Wiley came, as a boy of nine, with his father, to the farm which he now holds, and, before 1810, the latter found himself the inheritor of a flock quite good enough to bring tup-hirers about him. He might be said to have begun on his own account by giving Mr. Mason, of Chilton, fifty guineas for the use of Butter Lump for the season, and then for fourteen years in succession, Robert Collins never had to set him down as a July absentee. Shoulders, Carcase, Brother to Carcase, Ditto, a son of Symmetry, and Blossom (sire of the ram Ajax, for whom Sir Tatton bid up to 156 guineas, against Mr. George Baker, of Elemore) were the upshot of these outings; but Mr. Wiley valued none of them more than a sixty-guinea two-shear, for which he drew cuts with Major Rudd. His owner, who had used him as a shearling, kept him out of the letting-list as a three-shear; but the gallant Major would not be denied, and as all chance of hiring became a forlorn hope, he sent twenty ewes to him, at five guineas each. When the Barmpton flock was dispersed, Mr. Wiley turned his thoughts southwards, to the home of the Leicesters. His Durham Mentor had owed not a little of his own celebrity to that tup of Mr. Stubbins, the predecessor of the Burgesses, to which he sent, in conjunction with Mr. Sayle, of Wentbridge, a hundred ewes at three guineas; and he determined to better the instruction if possible.

There are few in the present Brandsby flock which cannot boast of such affinity; but still, Mr. Wiley has by no means limited his devotion to the memory of Burgesses' D. R., Old D., and D. V. In 1833 he first hired from Mr. John Stone, of Quorndon, and then became a constant customer to the late and present Mr. John Buckley, of Normanton Hill. It was from the Buckley flock that he drew his K.G. and D.N.; and at Mr. Stone's sale he bought the highest-priced lot—No. 6, a three-shear, which that celebrated breeder had used pretty freely as a shearling, and let to Mr. Pawlett in the following season. The union of these celebrated strains, all different both in size and points, to a breeder's eye, has made the present flock; and for eight or nine years back, Mr. Wiley has quite ceased to hire. In some seasons he has let as many as eighty tups to his brother Yorkshiremen, and other celebrated breeders; but the general average is about sixty. Setting aside some dozens of premiums at the shows of the district, his flock-book has no mean tale to tell of its success in the Highland Society's lists. In 1850, its tups were first and second in both classes at Glasgow; and earned the same honour at the Berwickshire show, four years afterwards, with the head prize for the pen of five ewes to boot. Again did the Highland Society affix the first "winning ticket" to his name in the summers of the past and present years; but, so far, he has only won a second prize at the Royal Society, and that for his pen of Chester gimmers.

Two or three Woldsmen, with Mr. Wiley, and the shepherd, among the tups in the home meadow, furnished a characteristic opening group, when, after a five miles' ride from the Gilling station, past a long woodland chain, sacred to "hard riding Ben," and the old Middleton blood, we at last reached Brandsby. The mist was perverse again, but with a little ocular perseverance, we made out that there was a ruined castle in the distance; and (by the aid of a gazetteer and an atlas), that we were at that moment, not only in "the wapentake of Bulmer and the union of Easingwold," but, better still, in "part of the bishoprick of Craike." Be that bishop a man or a myth, the long low-pitched house—with the dark green Cotoniastus creeping over it, and peeping with its red flowrets in at every lattice—which furnished us with a resting-place in his diocese, is quite the realization of a snug Yorkshire home. The freshly-christened Promised Land, first at Pickering, and second at Aberdeen, Landseer, Young Painter (a son of the sheep in Mr. Wiley's picture), Young Fatback, and divers others, were nibbling close up to the garden wicket; and one of Chester Symmetry's daughters was roving along the hedge side, and seasoning her bacon, by anticipation, with a dainty meal beneath the "cock-pits," which have been specially chosen from among apple trees, on account of their peculiarly thin and open wood, to engraft upon crab stocks in the neat hedgerows of the farm.

Mr. Wiley's holding consists of about seven hundred acres, and seem to take in three sides of a square. The ewes are kept principally on seeds, at his Warren House Farm, which is higher and lighter land, near the Wiganthorpe moors, while the tups are brought down during the summer to the Brandsby pastures. Sixty acres of the latter is glebe, and the remainder, a great portion of which is park, belongs to the Cholmeley family at the Hall.

Long and steady success as a breeder of shorthorns, Leicesters, and pigs, has not one whit weakened the belief in Mr. Wiley's mind, that the plough is the first great creditor of a nation, and he has followed rigidly in the track of his father, who began with thorns and stones, when the century was young, and then became one of the pioneers of hollow draining in Yorkshire. With his Shorthorns, which number about forty head, he has adopted the safe old rule of never refusing a likely offer when he could get it; and hence, except when he had something very much out of the common, he has never held for the mere chances of the Show-yard.

The blood of Comet was at fever-heat in the market, when he hired his first bull in 1814, and Mr. Wright, of Cleasby (one of the joint purchasers of the thousand-guinea wonder) found a youthful Lubin (388) exactly to suit him. Adonis, another son of Comet, from Beauty, and bred by Charles Colling, did him such good service, the two next seasons, that he followed him up with his own brother, Jupiter (343), and the succession was kept alive by North Star (459), and Harold (291), which were sent home when Robert had his sale in '18. Two years before that, Mr. Wiley had bought Mida from the Rev. Thomas Vaughan, of Houghton, near Darlington, and the strain pleased him so much, that he bore off her sire Midas (435) in his tenth year, in the Barmpton ring, after a tough rally with Sir William Cooke, for 270 gs., and a yearling heifer from Trinket as well. The money, which was laid out on this tribe, has never been a source of regret, as Grazier (1085), by Midas, more than brought it back. Old Anna's, of Helmsley, is not the only tongue which has waxed eloquent in the ancient red's behalf. Sir John Johnstone, of Hackness, used him for three seasons, and when the late Lord Feversham, Mr. Smith, of West Razen, Mr. Slater, of North Carlton, and Mr. Wiley himself had all dipped pretty deeply into him, he ended his days at fourteen, at Byram Hall. Gunthorpe, of the Castle Howard herd, which also used him, was one of his principal sons, and he was in his turn the sire of Malibran, for whom her breeder, Mr. Henry Edwards, got 300 gs. Mr. Whitaker of Greenholme's blood was also introduced at Brandsby, both through His Highness (2125), own brother to the 210-guinea Highflyer of the Chilton sale, and Abernethy (1602); and Sultan (1485), for whose ancestor Mary, General Simson gave 300 gs. to Charles Colling, was purchased from Mr. William Jobson, after he had been extensively engaged in Northumberland, in circulating what the borderers still fondly style "the good old Jobson sort." The principal result of the one year's service which he had out of him, was Sultana; and from her union with Belshazzar (1704), whom he hired from Castle Howard, there came a bull calf, which had good looks enough to be honoured at once with Mr. Wiley's favourite cognomen of Carcase.

Belshazzar, who got his stock very large and good-looking, was the sire of Victoria, which was sold from the Brandsby herd, for 160 gs., but Carcase (3285) was his greatest hit. The latter won the yearling bull prize in 1838, both at Thirsk and at York, where he divided the winner Hecatomb and the great two-year-old Duke of Northumberland in the classes for all ages; but still Mr. Bates was enabled to say that his crack was never beaten by a bull of his own age. A two-guinea sweepstake, rather a common practice of the time, at the same show, helped to swell Carcase's winnings to £65; and he was eventually sent to America for 200 gs., whither Miss Hudson, by Hermes (8145), and her calf, Miss Wiley, by Prince Royal (who was bought at the Hart Warren sale), followed him in 1853. Miss Hudson was from Mayoress, by Carcase, and her half-sister Lady Chandos, by Booth's Buckingham (3239), who came to Mr. Wiley's as a yearling, ended her career by winning the £20 prize in her class, and the gold and silver medals at Smithfield in 1849. Mr. Mason Hopper's Cherryble (5856) followed "*The Comet of Warlaby*," and then Vandyke (7669), who went directly back through Violet and Julia, to Lady Sarah, the highest-priced lot at the Chilton sale, was purchased from Mr. Pollock, of Mountainstown, Navan. His son Van Dunck (10992) was a second Carcase in the show-yard. He not only took the first £25 prize at the Yorkshire Society's Meeting at Thirsk, as the best bull of any age, but carried off the prize for the best two-year-old bull at the Highland Society; and after being placed second to Mr. Anthony Maynard's Crusade, in the Sweepstakes, passed for 125 gs. into the hands of Mr. Whitehead, of Little Methlie, near Aberdeen. He was from Eliza, by Rumour (7456), a son of Buckingham's, who was used for several seasons in the herd, and then let for a time to the late Mr. Bolden, of Hyning. John Bull (11618), from Mayoress, was his principal son, and departed after a long period of service at home, to Mr. Cruikshanks, of Sittyton, last year. Zetland (14409), by the Third Duke of York (10166), from Lord Spencer's Figurante, brought some Bates blood into the herd from Aske, and Fawsley also contributed its quota in Grey Friar (9172), whose decease and salt water embalment after he crossed ths Humber, is told in the annals of Aylesby.

And now from these Shorthorn data which we duly chronicled, with the Herd Books, prize lists, sale catalogues, and not a few medal cases, on the table, and half-a-dozen bulls, tups, and sows, looking calmly down on us from the walls, we slipped from the past into the present, and sallied out for a stroll. The orchard, of which the Hull pen of winners had taken bodily possession, was the first point of attraction, and Symmetry, the dam of the four young Usefuls, which took the first prize at Chester and Northallerton the previous year, was turned out of her stye for us, after a most vigorous protest. One of the Chester trio was sold to Sir Edward Kerrison, Bart., M.P., but there was another quite as good at home to make up the county prize lot, which fetched 12 gs. a-piece, thus making up 50 guineas for the four. The breed is the small Yorkshire white, and they fully justify a remark which we heard a tyke make on them last year at Northallerton, "*beaycon aw over—to the varra top of their heeds.*" This rare line of winners owes its origin to Mr. Colling, but it has been carefully crossed with boars from Castle Howard, Mr. Hall's of Kiveton, and Mr. Cook's of Owston. There are now few great pig breeders, from Prince Albert downwards, who have not set themselves up with a "Wiley," at some period of their existence; and Carcase, Young Carcase, Optimus, Dumfries, Dreadnought, Priam, and Stanley (Young and Old), have all upheld the Brandsby bacon dynasty, which has gone on at the rate of about half-a-dozen litters a year.

Two or three bullocks were ruminating on the York Fat Show, under some old thatched sheds in the adjoining yard, and three red John Bull calves were in another, hard by. One of them, Cavendish, was bound for Mr. Tindal's, of Knapton Hall, and there was Yorkshireman too, from Harriet, by Grey Friar. A level, thick-fleshed white bull, Sir Charles (16949), by Grey Friar, was waiting for us on the green, apparently "in excellent health and spirits;" and when we had scanned old Empress, the dam of Symmetry, as she took her afternoon's siesta on the dung-hill, along with her son The Colonel by The Duke, who had recently descended to gilt estate, we strolled away among the herd. Passing the church, where alas! three squires of Brandsby Hall, father and two sons, have in less than three years been laid to rest, we tarried to have one peep at the glories of the rectory garden, and then sought out a more congenial Briar Rose in the glebe meadow. The grafting of Zetland upon White Rose has had a most happy result here, and the only pity is that such a handsome roan should, after a trial of three seasons, have totally failed to breed. Her style, size, and substance are such, that Mr. Wiley might have been tempted to bring her to Baker-street this Christmas, but she was put forward too late to think of it.

More Shorthorns and Leicesters were scattered up and down the pastures of the wood shaded glen, in which she held the snuggest corner, and in the midst of them, a half-sister to The Friar, and The Knight by Booth's Red Knight from a Sulla cow, which had lately been purchased from the Duke of Leeds. The Zetland blood was well upheld among some fifteen or sixteen, in the home meadow, by a good old-fashioned cow, Lady Zetland, who traces her descent through Hermia to Buckingham and Belshazzar. There was Miss Lawley also, the dam of Cavendish, of a yellowish tint, which she derives from Mr. Anthony Maynard's Yellow Boy; and Sir Charles's dam, Albina, who was purchased by Mr. Allison at the Killerby sale, and sold to Mr. Wiley at his own. Years seemed to be telling on Wild Rose, the dam of Briar Rose, who has bred some five bulls in succession; Miss Crofton, a level good sort of cow by Lord Spencer's Zadig (8796), represented Mr. Spearman's herd; there was Agatha also, the dam of Fawsley; and Truth, good and compact, and true in this respect to the Lax blood, which she gets through her famous sire, Baron of Ravensworth. And so our observations on the triple alliance of Brandsby ended, and retracing our road through the glen, which echoed again with the notes of the carnival of St. Partridge, we exchanged the North for the West Riding, and sought a very different shrine on Doncaster Moor.

THE PROPOSED AGRICULTURAL BENEVOLENT COLLEGE.

In accordance with an advertisement, a meeting was held in St. James's Hall, Piccadilly, on Thursday, in the Smithfield Show week, at 1 o'clock, for the purpose of founding an institution under the above title, but with the more direct object of providing a fund for the relief of decayed farmers, their widows, and orphans. Mr. Alderman Mechi, with whom the project originated, presided over nearly a hundred who at one time were present, Amongst these were Lord Feversham, Major Parker, M.P., Mr. Wren Hoskyns, Mr. Jonas Webb, Mr. T. Crisp (Suffolk), Mr. Odams, Mr. Skelton, Mr. Grove (Essex), Mr. C. Lawson (Edinburgh), Mr. J. Parkinson, Mr. Heard, Mr. Cressingham, Mr. Chandler (Wilts), Mr. Howard Reid, Mr. Corbet, Mr. Bateson (Bath), Mr. T. Scott (London), Mr. Cutts, Mr. Halkett, and Mr. Bazin, the partner of Mr. Mechi.

The CHAIRMAN, in opening the proceedings, said, if he were asked why he had taken this matter in hand, he would reply that in all good works some one must make a beginning, and that when the institution was established, he would be happy to see the management entrusted to persons who had more influence than he had. As an alderman of the City of London, he had an official connexion with some of its principal charities, and he had often asked himself how it was that amidst the benevolent institutions which abound there was none connected with the greatest interest in the kingdom. Agriculturists generally were neither poor nor unwilling to assist their needy brethren, but agriculture did not yet know her own power and resources. There were in the United Kingdom at least 500,000 farmers, occupying 50,000,000 acres of land, and paying an annual rental of £50,000,000. The value of the land itself, taken at 25 years' purchase, was £1,250,000,000, and the capital of the tenantry invested in the land, taken at £5 per acre, which was a low estimate, amounted to £250,000,000 more. Besides being wealthy, he felt quite certain that agriculturists generally were charitable. That they were hospitable, everyone knew; and hospitality and charity ordinarily went together. They only wanted an opportunity of exercising their charity, and when this was afforded the work would be well and amply done. Of the need of such an institution as was contemplated abundant testimony was afforded in letters which had been addressed to himself in relation to the object. What he proposed on that occasion was the establishment of an institution which would afford support or assistance for a certain number of decayed farmers and their widows, and provide a suitable residence and education for orphans. In order to carry out these objects there would be a building fund, an endowment fund, a fund for general purposes, and, what was the most important of all, an annual subscription list; and he had no doubt that when the institution was fairly established it would, like other benevolent institutions, have the benefit of occasional charitable bequests, which would help to render it, what it certainly ought to be, the greatest charitable institution in the kingdom. Success must of course depend in a great degree on economy and judicious management, and hence he thought it desirable at the outset to obtain some old mansion, instead of proceeding to build without having the requisite funds. As regarded the mode of management, it was intended there should be a council, consisting of about 50 persons, who should appoint a working committee. The election of pensioners would of course proceed on the true British principle, that those who subscribed money should have a voice in its application. With respect to the site for a building, he hoped that when there were sufficient funds in hand to build with, some benevolent landowner would make a grant of land—perhaps in a locality where land was not very valuable. He (the chairman) was of opinion that the site should be within about 30 miles of London. As an alderman of the City of London, he knew the importance of dinners as respected charitable contributions (laughter), and therefore he thought the new institution should have an annual festival at the London Tavern. Great care should be taken that the funds were applied solely to the legitimate object, and this was provided for in the resolutions about to be proposed. These were, of course, only general outlines of the scheme; it would be for a committee to consider them, suggest alterations, and report to a future meeting. Among those, not farmers, from whom support might fairly be looked for, were cattle salesmen, corn factors, and millers, country bankers and solicitors, landlords, and implement makers. In conclusion, he trusted the object would command an amount of support commensurate with the extent and importance of the class for whose benefit the institution was designed (cheers).

Mr. Thomas Batson moved the first resolution, viz., "That this meeting having heard Mr. Alderman Mechi, cordially approves the project submitted by him for the founding a college for the reception of unfortunate and distressed farmers, their widows, and orphans, considering that the magnitude and importance of the agricultural interests of this country justify and demand the establishment of such an asylum for the befriendment of those connected therewith, once in respectable and affluent positions, but by misfortune reduced to comparative poverty and indigence." Having been for some years intimately connected with agriculture, he felt the greatest pleasure in supporting Mr. Alderman Mechi in the good work which he had commenced. He had a deep sense of the importance of the object, and felt confidence in its chief promoter.

Mr. T. Scott, in seconding the resolution, said, while the object had his entire approval, he hoped the institution would be conducted on such a plan that many persons might receive assistance in their several own localities.

A suggestion from Mr. Halkett for including market-gardeners in the action of the institution having been met with a very clear expression of dissent, the motion was put and carried.

On the motion of Mr. Chandler, seconded by Mr. Skelton, it was resolved: "That, subject to royal assent, the title of such institution be, The Royal Agricultural Benevolent College."

Mr. Lawson, of Edinburgh, moved the next resolution, viz., "That the privileges and benefits of such college be restricted exclusively to the *bona fide* farmer, who has followed that occupation in the United Kingdom, as an exclusive means of support, for a minimum period of not less than twenty consecutive years; whose holding, either as tenant, or proprietor and tenant, during that term, has not been less than fifty acres; and that the like restrictions attach to the widows and orphans of farmers who, during their lifetime, had not fulfilled the above conditions." Having just travelled 400 miles, he had posted down to that meeting expressly to support Mr. Alderman Mechi in his excellent scheme, which he now felt sure would be carried to a successful conclusion (cheers). There was scarcely a trade or calling in the country which had not some benefit society or charitable institution connected with it; and why, he asked, should agriculture remain an exception to the rule?

The resolution, after being seconded by Mr. Winkworth, was put and carried.

Mr. Jonas Webb moved the following resolution:—"That this meeting, being impressed with the importance and paramount advantage of concentration of object and purpose, in the successful establishment of an institution of this character, earnestly recommend the devotion of the energies of its promoters and the appropriation of its funds as they may accrue, specially—1st. To the in-door support of those who are the successful candidates for its bounty, by the temporary occupation of a building adapted to the purpose. 2nd. To the erection of an asylum, in such locality within 25 miles of London, on such site as shall be presented by free gift for the purpose, and possessing advantages of easy communication, &c., of a character consistent with the magnitude of the interest it is to represent, and the extent of accommodation which will be required for the purpose of the college. 3rd. To its permanent endowment. And while highly approving the system of out-door pensions, defers its adoption until the in-door principle is fully and successfully developed." No good could be done without a large number of annual subscriptions, and he (Mr. Webb) trusted, therefore, that they would be forthcoming.

The resolution was seconded by Mr. Cressingham, of Carshalton, and adopted.

On the motion of Mr. Reeve, of Norfolk, seconded by Mr. Ravenscroft, the following resolution was agreed to:—'That farmers of every religious denomination be eligible for election who shall not be less than 60 years of age, except in special instances of bodily injury or infirmity, permanently disabling them from following any occupation as a means of support; in such cases, 45 years be the minimum age; for widows, 55 years of age; for children, 7 years, and remaining until 14."

Mr. Maddison, of Spilsby, moved, and Mr. Bruce seconded the next resolution, viz., "That the selection of the committee, *pro tem.*, from the list of subscribers, of not less than ten nor more than sixteen (one-half of which number to be farmers or landowners), to consider and prepare the bye-laws and regulations, apply for a charter of incorporation, and generally to prepare the scheme of management and future operations of the college, be placed in the hands of Mr. Alderman Mechi; such committee to report, at a meeting to be called in May next, the issue of their deliberations.

The Chairman said the meeting might rely upon it he would endeavour to make a selection which would give confidence to the agricultural community at large (Hear).

The resolution was then adopted.

On the motion of Mr. Causton, common councilman of the City of London, seconded by Mr. J. Cutts, of Little Bardfield-hall, Braintree, it was finally resolved: "That every subscriber of 10s. 6d. per annum be entitled to one vote in all elections; every subscriber of one guinea per annum be entitled to two votes; every subscriber of more than one guinea per annum be entitled to two additional votes for every additional guinea so subscribed. And that every donor of ten guineas and upwards be considered a life subscriber, entitled to one vote for each ten guineas so given, at every election, and be eligible as a member of the council."

In reply to a question from Lord Feversham,

The Chairman said he apprehended that persons who gave £50, or any large amount, would be entitled to votes in respect of their donation, independently of their rights as annual subscribers. He further stated that the committee to be appointed would report to a meeting to be convened about May next.

Mr. Wren Hoskyns, in moving a vote of thanks to the chairman, deprecated any notion on the part of farmers that the proposed institution was to be a substitute for providence on their own part; and, after expressing his admiration of the chairman's energy and courage, declared it to be his strong conviction that the new institution would be a flourishing one.

Mr. Lawson seconded the motion, which was carried by acclamation, and

The Chairman briefly returned thanks.

Before the meeting separated the subscriptions, paid and promised, amounted to nearly £2,000.

FURTHER EXPORT OF STOCK.—On Wednesday, Dec. 21, the large and beautifully built A 1ship "Lloyds," Captain Harrison, left the London Docks, having on board a valuable collection of live stock, consisting of twenty rams from the well-known flock of the Messrs. Sturgeons, of Grays, some shorthorn bulls, and the prime stallion "Iron Duke," bred by Mr. G. Townshend, of Stony Stanton, Leicestershire, which took the first premium at the recent meeting of the Leicestershire Society as the best horse for agricultural purposes. The whole of these have been carefully selected by Mr. H. Strafford, and are exported by Mr. Weston T. Tuxford. They are destined for the Sydney district of Australia. Every possible attention has been given to the building of the stalls, &c., to convey the animals safely over to the antipodes. The bull and stallion boxes are lined or padded with drugget, whilst the animals stand upon a carpet of cocoa-nut fibre. This has been done with a view to guard against the known evils of cold which have so frequently cut short the lives of some of the finest animals that have been shipped from this country. The stock is consigned to the order of Messrs. I. and J. Gorrick, of West Maitland.

FENCES.

When the whole length of the site of the hedge has been trenched, stones picked out, and weeds eradicated, as previously described, and any little inequality of surface nicely levelled, the line is next stretched somewhat tightly, on which the operator gets, and by shifting himself along sideways, treads and firms the trenched soil to a breadth of about 6 inches on each side of the line, and along its entire length. In returning he levels down, and beats smooth his track with the back of his spade, and fills up any hollow or depression that may exist. The next operation is to make a neat opening on that side of the line on which it is fixed the hedge shall be, and of a depth sufficient for the roots of the plants, which will vary from 6 to 10 inches. The plants are now brought forward and prepared by cutting off the tops, leaving about 4 inches of stem next the roots, and in putting them in the opening along the side of the firm and level edge, care must be taken to leave about 2 inches of the stem above the surface ; the soil is carefully returned, and the whole made firm and level, and the operation is complete.

The cost of labour for this mode of fence, trenching, planting, and otherwise completing, will not exceed 1s. 6d. per chain.

We have hitherto been writing on the supposition of the soil and situation being favourable for the growth of the thorn ; but on thin, light soils, and exposed situations, it seldom makes a permanent or satisfactory fence unless planted in combination with the beech, which on very exposed situations—provided the soil be light and dry—will thrive and do well, and act as a nurse to the more delicate thorn. Therefore, on such situations we should recommend a mixture of one or two-thirds beech with the thorns ; and on upland farms, where the chances of the latter doing well is at all times precarious and uncertain, a fence composed entirely of beech-plants would not only thrive better, but, by retaining its leaves through the winter, afford shelter almost invaluable on those high-lying situations. The mode of preparing and planting a mixed, or entire beech-hedge, is similar to what we have described for the thorn, the only difference being that, while the thorn requires an annual pruning in its earlier stages, the beech must not be cut at all until it is firmly established in the soil, when, like the thorn, it must receive a regular annual cutting.

We now come to the after-management of the young hedge, and on this head, unless due care and attention be paid, the most favourable of soils, situations, and modes of planting will not secure the cultivator from failure and disappointment. The great essentials necessary to promote a healthy and vigorous growth of fence are, that the roots be kept free from weeds ; that it is regularly trimmed over with the switching-knife ; and that, during its early stages, it is protected from the ravages of hares and rabbits. Where such are abundant, it is almost a sheer waste of time and money to plant hedges, unless effectual means be taken to afford them protection.

For upwards of five years I was witness to the baneful effects produced by their nibbling, which rendered inert and comparatively useless management that, under happier auspices, would have raised good and permanent hedges. During the spring months, they cropped the tender shoots from the stem, and in not a few instances stripped the bark so completely from the plants, as to render their decease a matter of certainty. At five, they had made no more wood than they should have done at two years ; and, indeed, so much was the general health impaired, that it was very doubtful whether any future management would succeed in restoring them to vigour.

Therefore, where hares or rabbits are numerous, it is imperatively necessary to have the young hedge protected from their browsing. There are various ways of accomplishing this ; and when the fence is protected on either side by railing, it is a very neat and expeditious method to fasten wire netting to the rails on each side the hedge, which answers the purpose admirably ; and when no longer wanted, the wire can be rolled up and preserved for a future occasion. The cost of the wire is rather considerable, which will probably deter many from following this plan ; and, except to those who have the means of putting the netting to future use, the purchase of it is hardly to be recommended. Another way of protection is by cutting on each side the hedge what is known locally as a "dead fence." This is performed by digging at a proper distance from the hedge a trench, into which are inserted thorns, cut to something near one length, placed close enough to prevent the ingress of hares or rabbits, and high enough to protect the hedge from the inroads or encroachments of cattle. This, if properly made, will afford ample security from the incursions of the game as long as there is necessity for it, though it may require renewing before the young hedge is fence enough for cattle. This species of protection, though primitive, is probably, on the whole, as economical and as suitably adapted to the purpose as others of more showy appearance. The only great objection to it is, that it too much excludes the air—a circumstance not at all favourable for the well-doing of the hedge, though this may in a great measure be overcome by keeping it a pretty good distance from the plants on either side.

We have now the hedge planted, and secured from the intrusions of cattle and vermin ; and the next great points of management are, that it is regularly cut, and kept free from weeds. The form which it is intended the hedge should assume, should now be determined on ; and every subsequent cut of the knife should tend to encourage the growth of the hedge in that form. The best and most approved form of a cultivated thorn-hedge is the wedge shape—that is, with a regular slope from the base to the top. The advantages of this shape in a hedge are so obvious, that it is unnecessary to point them out here.

Assuming the hedge was planted in February, the shoots during the following summer will have made considerable progress, varying from one to three feet.

It is, I believe, a custom pretty universal to cut over in the autumn the first year's shoots; but from this practice I dissent, believing it to be much better for the future welfare of the fence, that the first cutting be left until it has attained two years' growth of wood. Any one who has a recently-planted hedge can easily test the correctness of this view, by cutting a portion at one year, and another portion at two years' growth; and I pledge myself—other circumstances being equal—you will find the uncut portion put forth shoots earlier, healthier, and stronger, and in autumn will altogether present a more vigorous and forward appearance than the portion cut over at one year's growth. The reason of this is obvious: the plants require a firm establishment in the soil before any cutting takes place, and if cutting over be resorted to before this is accomplished, the effect is to bleed, and so weaken the vital functions of the plants. After they are firmly established, which in ordinary circumstances will be in two years, a regular annual cutting over will be necessary to maintain a neat appearance, and also as tending towards the promotion of a vigorous and healthy growth, and ultimate longevity.

Sometime during the month of November of the second year, cut down the shoots to about nine inches from the ground, and also cut in the side shoots pretty closely. In the third year again dress off the shoots, but this time to a height of twelve inches from the surface, and leave about an inch of the side shoots. This is repeated annually, but leaving the hedge four inches higher, and one inch on each side wider every time it is cut until the desired height is attained, which height for general farm purposes will be best about four feet.

During this period, attention must be paid to the cleaning and keeping the roots of the fence free from weeds. If this is neglected evil consequences will follow. When weeds are allowed a free unchecked growth, they tend to discourage the growth of the lateral branches surface-ward; for though during the summer months it presents a close and apparently compact fence, yet when the frosts of winter have reduced the growth of the grass and weeds, it will show a bare, open, fenceless bottom, ready to give way to the first rush of any restive animal inclined to stray. This is a very unsatisfactory condition in which to find the young hedge, and the complacence of the cultivator is not apt to be much increased by the knowledge that it might have been prevented, and that he might, by the simple operation of keeping down the weeds below and for a foot on each side of the hedge, have had a close-bottomed and impenetrable fence, capable of resisting the inroads of any description of cattle.

When the hedge has attained the desired height, it must at every consecutive cutting be kept down as close as can be to that height and width; but in the course of years, however well kept, it will increase in bulk, and present a loose and overgrown appearance. This arises from short pieces at the base of the shoots being annually left, and which in time increase the dimensions of the best-kept hedges, rendering it necessary to reduce their size, and to cut so as to encourage a new form of fence. This cutting is performed in two ways, the choice of which must be determined by the condition of the fence. If bare and inefficient as a fence at the bottom, it will be necessary to cut off the whole hedge to within a little of the surface, the after-management being necessarily the same as heretofore described for a young hedge. If the fence has been kept clear of weeds at bottom, and is otherwise sufficient, the proper manner of reducing its bulk is to cut off the side-branches to within 4 inches of the main stem, and also to cut it down to about the height of 3 feet. This process is termed *ribbing* in, and may be performed any time between the months of November and April. Although in the case of the hedge being very old, or otherwise not of a vigorous growth, I should neither cut down nor rib in until the latter end of the last named month, and for this reason: that if plants are cut when the sap is up and in full flow, they never fail to make shoots, although they may not be so vigorous as if the parent stems were cut in a dead time of the year. Yet the difficulty in this case is not to decide on the advantages of tender and vigorous shoots, but whether it is better to have comparatively tender or no shoots at all; as the chances are very precarious of very many of the stubs of the above descriptions of hedge when cut during the winter months ever making shoots again. If the enclosure within the fence requiring reducing be in alternate husbandry, a period should be chosen for the operation, when the rotation comes to grain crops; otherwise, if the field is in pasturage, a protection from the browsing of sheep and cattle will be necessary for a period not less than two years. Probably as good a protection as is necessary will be found in setting a flight of hurdles, which when no longer wanted will be useful for something else. It may be necessary here to say a word or two on the means of replanting or making up any failure occurring in the hedge. For this purpose some recommend a second planting of thorn; others substitute crab-tree plants. The former seldom does well in an old hedge: the latter is more likely to succeed and frequently does well; but for all such occurrences as old thorns dying out, trees stubbed in the line of fence, or any other gap whatever requiring making up, we should strongly recommend a trial of the beech: it will thrive well when an old thorn has died out, or on the site of an old tree; and in the formation of a cultivated hedge, we have great faith in its proving a most useful auxiliary to the white thorn, and believe its properties only require to be better known to render it very extensively cultivated.

In conclusion, it may be well to state that in cutting hedges there is a general rule which should be particularly attended to, and, except for special purposes, never be departed from. This golden rule is comprised in two words, viz., *cut up*. It is well-known that even at the present day the matter is no better understood than it should be, and that many intelligent practical men, who never give it a thought, seldom know there is in effect any difference between cutting up and cutting down. A moment's glance will suffice to show that an edged tool in cleaving wood occupies space, and necessarily exerts a pressure on one or both sides of the resisting material. In cutting the stem of a bush, if the blow is struck upwards the whole pressure falls on the stem which is cut off, leaving the stub sound and smooth; but if cut down the reverse is the case, the pressure is on the stub, which it shatters to pieces, while the stem cut is left sound. Supposing the axe descends vertically on a stem laid horizontally, the stroke effects a pressure on both sides, and both are injured; which is the precise effect occasioned by the shears in clipping hedges. Therefore clipping is not to be much recommended. When trees or hedges are cut down and the stubs left shattered, as they necessarily will be, the rain descends and lodges in the crown of the roots, and then generates canker and premature decay. The shoots which spring from such stubs may be numerous, but they will be feeble and puny, and liable to break with the first strong wind or fall of snow. The reverse is the case when the hedge is cut up: the stub is left sound and impervious to wet and canker, the shoots come strong and healthy, and are able to contend against the vicissitudes of the weather. Therefore, in hedge culture, in which the cutting forms no unimportant part, it will amply repay the cultivator any little trouble he may meet with, if finally he can establish and enforce the rule, *cut up*.

W. J. MOSCROP.

Forest Farm, Great Ribston, Wetherby.

THE HADLEIGH FARMERS' CLUB.

The late meeting of this Club closed with a solid discussion on the roots shown, and the means adopted for their successful cultivation. Mr. Gurdon, judge of the Essex County Court, was a prizeman for the best two acres of mangold; and Mr. Garnham, his bailiff, stated that, in the first place, the land was ploughed in December, across, as it was called. It was ridged, and in January backed; after that, about seventy loads of grass were taken off the nine acres, and then it was subsoiled between the ridges. In February, about 300 bushels of lime were added to the 70 loads of grass; the land was then ploughed back again, and subsoiled with one of Bentall's subsoilers between each ridge. The lime with the grass was next added, and about eight loads per acre of farmyard manure. After that it was sown, and two cwt. of guano, two cwt. of superphosphate, and four cwt. of salt used; making about twelve loads per per acre of grass, lime, and manure. The plough was afterwards used again, and the drill about the 10th of May, which Mr. Gurdon considered too late. The ridges were thirty inches apart, and the plants were set out thirteen inches apart.—Mr. Joseph Rand, who had the best two acres of swedes, said he scarified his lands early after harvest, which was his general system when he wanted early roots; in the early part of the spring he adopted the usual treatment, and he applied farmyard manure principally made from beasts and sheep well fed with oilcake and roots. He put on ten loads per acre, and nothing else, for he found it acted much longer in the land than artificial manure, and a root crop did not exhaust it so much. He had found salt, however, very beneficial for mangolds. He put his swedes in in the second week in June; it was a four-yards stetch, and he had six rows in a stetch. He hoed them out generally about six inches apart. Although the weather had been hotter than in two previous seasons, there had been more frequent showers and heavy dews. Drought caused mildew, and mildew rot; and then there was a woody fibre, and an inferior quality of swedes. Many persons thought diminution in weight was attributable to the exhaustion of the soil; but he thought that if the seasons changed again, as good turnips and as good swedes would be grown as before. Bringing the crop forward very early was likely to induce mildew, particularly in very hot seasons; on the other hand, by the early sowing of swedes on heavy land, it would be found that they produced most weight. Heavy land required to be sown a month sooner than a light soil; if not, the plants growing on it so much slower than on turnip land, there would be a falling off in weight.—Mr. Robert Rand, in explaining his treatment of white turnips, said he farmed on much the same system as his brother. He generally made his furrows at Michaelmas; and if the weather was suitable, scarified or ploughed his land, whether he intended it for a turnip or a beet crop. He crossed the land in November, stetched, turned it back, ploughed it three times, and cleaned it well. The manure, ten loads an acre, was made entirely from sheep fed on mangold, oilcake, malt coombs, and corn, and it was very rich and good. He had had an opportunity of hoeing but once. The turnips which had obtained the prize were drilled seven rows on ten and a-half feet, and were thicker than his brother's. He did not approve of their seeding, but liked a full plant for everything.—Mr. R. Partridge, on the part of the judges, stated that they had calculated the weight of the roots separately from that of the blades, giving the prizes to the greatest weight of roots with the smallest weight of blade. They first went to Mr. Robert Rand's, Ivy Tree Farm, and saw a beautiful piece of yellow globe. There were 74 roots to each rod, and the weight, without tops or blades, was 40 tons 6 cwt. 1 qr. 20lbs.; the weight of the blades 6 tons 9 cwt. 1 qr. 4lbs.—total 46 tons 15 cwt. 2 qrs. 24lbs. They were very fine, clean and regular, and grown on the stetch. Mr. Joseph Rand's was the next piece they looked over: the roots were grown on an old pasture broken up, peaty hollow-bottomed land. The weight there without the tops was 39 tons 17 cwt. 3 qrs. 12lbs., and the extraordinary weight of 12 tons of tops, making a total of 51 tons 17 cwts. 3 qrs. 12lbs. The average number of roots to a rod was 79. They next went to Mr. Gurdon's, and there they found a splendid piece of beet, rather wide in the furrows they thought, and thick on the ridge. They were of beautiful quality, grown on a sandy piece of land high farmed for roots. The avarage of roots to the rod was 100½. The weight per acre was 40 tons 17 cwt. 0 qrs. 16lbs., the blades 5 tons 11 cwt. 1 qr. 20lbs., making altogether 46 tons 8 cwt. 2 qrs. 8lbs. Thus Mr. Gurdon's blades had the least weight, while his roots had the most weight, being 10 cwt. 2 qrs. 24lbs. heavier than Mr. Robert Rand's and 19 cwt. 22lbs. heavier than Mr. Joseph Rand's, putting the blades out of consideration. They weighed Mr. Robert Rand's before and Mr. Joseph Rand's after the frost. The reason why the Judges considered Mr. Gurdon's beet the most worthy of a prize was because they were grown on sandy land, and the roots they thought had a more fattening quality for stock and would keep longer into the summer than those grown on heavy-bottomed land; beet of the quality of Mr. Joseph Rand's, though it was a magnificent piece and stood very high, as high as sheep-hurdles almost, would not keep so late as Mr. Gurdon's, nor was there the same fattening quality in it. At Mr. Gurdon's they thought if they had not been so far apart in the rows and a little wider from beet to beet he would have had a still heavier crop. As to swedes, they first went to Mr. Robert Sheldrake's, of Kersey. The average number of roots to the rod was 174; these they weighed with the tops, but cleaned them as they did the mangolds, and they were quite ready for stock to eat. The weight was 23 tons 1 cwt. 1 qr. 20lbs. They were sown broadcast and were a splendid piece, but Mr. Sheldrake had scruples that there were not two acres of them, and finding an eighth short he withdrew from competition, though there was no other piece equal to them. At Mr. J. G. Stow's there were 191 roots to the rod, the weight 17 tons 4 cwt. 1 qr. 4lbs. per acre: they were a nice piece of swedes, clean, singled out well, but too thick in the plant, though on heavy lands it would not do to have them too thin. From his experience, having gone round many years, he should say that where beets were too thick they would not be likely to carry off prizes. He found this year, on weighing two rods from the same field, that in one instance there were 11 beet less to the rod and over 100lbs. more in weight. It would not do to have them too thick if they wanted weight, and this remark applied, though not so strongly, perhaps, to swedes. Mr. Joseph Rand's, which took the prize, were drilled 26 inches apart: there were 119 roots to the rod; it was a beautiful piece, very clean, and a good stock apparently. There were 19 tons 15 cwt. 2 qrs. 24lbs. They were well farmed with good farmyard manure, and were worthy the prize. They were drilled, and were not so many plants to the rod as Mr. Sheldrake's by 72; and he thought that this was how 4 tons difference in weight was to be accounted for. At Mr. Grimwade's they only measured one rod; they fancied they were sown rather too early or too late, and were not a good stock but bad-bred ones, a great many appearing a good deal like coleworts: the weight 18 tons 17 cwt. 16lbs. per acre. For white turnips there were only two entries—Mr. Stow's and Mr. Robert Rand's. Mr. Stow's, like his swedes, were rather too thick in the plant; they were a beautiful piece, in full growth at the time the Judges saw them, and if the weather had held open he dared say they would have been splendid. There were 184 roots to the rod, the weight 21 tons 2 cwt. 16lbs. The next piece was Mr. Robert Rand's; it was a very fine piece quite fit to feed off at the time the Judges saw them, a very full plant and very clean, the average 161 roots to the rod; the weight 26 tons 5 cwt. 2 qrs. 24lbs. per acre.—Officers and so on were appointed for the ensuing year on the conclusion of Mr. Partridge's speech.—Mr. J.G. Stow proposed that next year a prize should be offered for Suffolk Down sheep instead of for ordinary Southdowns. The Suffolkdowns, Mr. Stow described as a cross between the blackfaced Norfolk and the Down sheep, which had not been exhibited at the Society's meetings for some years.—Mr. Sheldrake, in seconding the proposition of Mr. Stow, said, when ewes made over 50s. per head, they were generally Suffolkdowns. Mr. T. Hawkins recommended that an extra prize should be given to the Suffolk sheep; but deprecated the exclusion of Southdowns. Mr. Sheldrake had spoken of the ewes making an extraordinary price, but it was merely because the Norfolk sheep were always characterized as great breeders and little mutton makers; the cross gave them a little more mutton, and consequently they were more in repute for breeding purposes, Mr. Sheldrake should remember at the same time that the wether lambs sold for 3s. or 4s. less than Southdowns. Mr. Dobito told him last year at the meeting of the Suffolk Society that Mr. Waterhouse Hawkins, who gave lectures on extinct animals, said that Southdowns would soon have to be included amongst them, but he himself was inclined to think the Suffolkdowns would go first. He spoke very disdainfully of the characteristics of the male Suffolkdowns, and thought that if a prize were offered to that class, it should not be taken away from another by a cross with which it was produced. He would undertake to show five Southdowns against five of Mr. Sheldrake's Suffolkdowns for five sovereigns at their next meeting.—Mr. Sheldrake declined the challenge.—The proposition of Mr. Stow was not pressed, but left for the decision of the committee.—Mr. Gurdon entered upon some explanations with regard to the transplantation of mangold, a matter in respect to which he had made experiments. The seeds, he stated, were raised in a box. The number of plants put in was 398, and some few failed, as they always would. The vacancies thus occasioned were not supplied with very great care, but still they were filled up, and the result he held in his hand, viz., 398 roots put in and 398 taken up; therefore he had no hesitation in saying that they might have every root on an acre if they liked to attend to it, and, he thought, without any unreasonable expense or trouble.—Mr. Garnham was so anxious about his row of roots that he would not even let his best hoer hoe them, but would do it himself; and he was so nervous at the end that he hoed up one of the roots, and, certainly, one day after dinner he did go down with a bottle of liquid manure, and tried to raise one in its place, but he never succeeded in getting it much bigger than his fist. This showed that merely taking a root out with a spud was not the same thing as transplanting in the way he had done. He remembered telling the meeting last year that the great secret was to preserve every fibre. He did not say it was at all necessary to grow the plants in boxes, but let them put some boards on the top of a muck heap, and then four or five inches of earth on the boards, and so raise the plants; and when they wanted roots to transplant, let them not take them up, but turn them over, and they would thus get the plant with every fibre on it. Such was the experiment he had tried, and the account was that the twenty heaviest weighed 211 lbs., above 10lb. each; the twenty lightest 72 lbs.; of the remaining roots, of 337 the average was nearly 7lbs. each. He would be candid towards Mr. Rand, who had said that if they were grown in a field with a row on each side there would be a difference, and he should have the benefit of this, for he would state that his roots last year were were all about 7lbs. on an average; this year they averaged about 6lbs., the whole weight of the 398 roots being 168 st. 12lbs. If they would take 398 roots at 13 in. apart he thought they would extend as near as possible to 4 rods of ground. They might take it, for all ordinary calculations, at 4 rods of ground; and he thought that would give about 42 tons to the acre. Therefore, unless the judges had made a very bad shot in the 2 rods of ground they selected when inspecting the acres, the transplanted mangold beat the rest of the field; but it was a most difficult thing to go into a field of 8 or 9 acres, and select a fair average couple of rods. He had in his pocket also an account of another 4 rods. He had from these 4 rods 477 roots, which was as nearly as possible 119 roots to the rod; and the weight was 180 cwt. 13lb., or at the rate of 45 tons per acre. This was the first 4 rods he came to. He walked into the field, made no choice at all, told his men to take it up, had the produce weighed; and they now had heard what he obtained. He made the transplanted roots to come to rather better than 42 tons per acre. The judges had stated the weight of the roots they took up; but whether he had taken off the tops and tails quite so close as Mr. Partridge had done, was a question; and this might give a little more weight. Whether they drilled or whether they dibbled, the mangold crop was certainly a very important one; and it was most important to get as regular a crop as they could. Mr. Partridge has said the plants were set rather wide—at 30 inches; but, if he recollected aright, Mr. Rand's, last year, were set at 32 inches. Mr. Gurdon next dwelt on the importance of farmers knowing what weight of roots they grew. He thought the mangold a very valuable crop; and he hoped his would supply some of the loss which he, in common with others, had suffered in stock. There had doubtless been enormous losses in stock this year; and, in his own case, he looked to his field of mangolds to bring in additional £100 or £200 to make up his losses; and he stated he should be sorry to sell the produce of his field now for less than £40 an acre. He hoped, if he lived another year, still further to carry on his experiment, and should be very glad, if Mr. Rand would like, to compete with him. He did not want to cook up two acres, but fairly to take that quantity; and Mr. Rand might take two acres, drilled, truly set out, but not transplanted. He should like to alter the distance a little; for he was not at all prejudiced in favour of any conceit he had taken up. There was one remark he should like to make, in answer to what Mr. Robert Rand had said respecting his cooking rather high. Mr. Garnham had told them that he took off 70 loads of twitch. He thought he had very wisely returned it to the land, and had no doubt he had derived a little profit from it; but every experienced farmer would know that those 70 loads of twitch had taken something out of the land, before being returned upon it. Therefore, if he cooked a little richly after this exhaustion had been going on, he thought he was right. He did not know, after all, that his 2 cwt. of guano, 2 cwt. of superphosphate, and 4 cwt. of salt, with lime, &c., had cost so much as the cooking of bean-meal and barley-meal with which Mr. Rand fed his sheep.—Mr. Rand, in subsequently addressing the meeting, said when Mr. Gurdon talked, last year, of transplanting mangolds, he supposed that he meant the taking them out where they were grown—a plan which generally resulted in failure, the tap-root being injured. With all his (Mr. Rand's) experience, he had never found a transplanted mangold come up equal to those which came up from seed. Mr. Gurdon had certainly taught him how to grow transplanted mangolds; but he believed he had grown his own mangold cheaper than Mr. Gurdon. The piece of ground had mangolds on last year, but he did not take a prize for roots from it, but from some of the same description of land. The produce was about forty tons, of which he kept about twenty, with which he fed his sheep on the piece, and all he did to the land was to plough it once; after the sheep had fed off these and artificial foods, he drilled mangolds, and the result was what had been stated to them. When the plants came up the wire-worm played sad tricks with him, so that he had to put in more seed; in many places as much as one-fourth was taken off. These fresh seeds were too late, and did not come up as they might have done, but if he had got the weight the judges had announced, he would say it was a profitable crop, and he was very well satisfied. Had he put in a little more farm-yard manure, he thought he should not have stood in the position he now did; but he admitted he was fairly beaten, though another year he would do his best to succeed. Mr. Rand concluded by a strong appeal in favour of increasing the growth of mangolds, as a crop of very great importance.—The health of Mr. M. Biddell, the vice-president of the Ipswich Farmers' Club, was afterwards proposed; and Mr. Biddell, in responding, said, as to transplanting beet, Mr. Gurdon had thrown much light upon it. He himself had gone on Mr. Rand's system, and thought it a poor substitute for a good plant; he put in a root and expected it to grow, and it did keep alive, but it increased very little, and the thing he had found hardly worth doing. Planting on boards he thought a capital plan.—Mr. Gurdon next directed attention to the losses sustained recently among stock, observing that he much regretted to hear that a neighbour of his own, in an adjoining parish, had lost about five score of lambs in a short time. He himself was not a sheep breeder, his not being a breeding farm, but in bullocks his losses had been greater even than others in comparison with his occupation, so great that he had thought it desirable at once, on the suggestion of Mr. Fisher Hobbs, whom he had happened to meet and talk with on the subject, to write to the Council of the Royal Agricultural Society that they should either at their expense or his own send down the veterinary surgeon of the Society, Professor Simonds. Well, he came down; and his first observation was, "My advice is, to send it to the butcher's." His (Mr. Gurdon's) answer was, "I could do that without sending to you; I sent for you to know if science can aid us in this matter. We are in a difficulty, and we do not know the cause of this disease. Now, prevention is better than cure; and I want to know, not merely how I may save the animals in the yard, but how I may prevent any future ones on my farm from taking the disorder, if possible." He thought it would be well to state a few facts, so far as his experience went; for it was, as Mr. Biddell had stated, by giving facts here and there that they might see if they could put them together and draw conclusions from them. He confessed he was much baffled; he had thought much upon the subject, but he certainly got very little information from Professor Simonds as to the cause of the disease. No doubt that gentleman gave conscientious advice in telling him to send to the butcher; but that was only the £ s. d. consideration, that the first loss probably would be the least loss. There was one thing he ought to state. He said to Professor Simonds—"First let me ask you if there is any objection to sending these animals to the butcher? for I do not think it is for those who are not absolutely in positive need to pack off a quantity of flesh for human food when it is unfit for that purpose." His answer was—and he thought it right that it should go further—"There is not the slightest objection in the world, unless the animal is in the last stage of life: when the disease has arrived at that extent that the whole animal is inflamed all over—then, no doubt, it is improper to send it to the butchers: probably that would only take place within the last day or two of its life, therefore up to that time there is not the slightest objection to its being consumed for human food." Then, as to the treatment, Professor Simonds examined two bullocks; he tapped them about just as a physician would do when wishing to see if a person's lungs or liver adhered to the side. He then said, pointing to one of them, "That bullock is a hopeless case"; and he was quite right, for it died. He asked Mr. Garnham what he had done, and he said he had only dissolved a Cupiss's ball, and given it that. Professor Simonds gave a prescription; and the only difference he could make out was, that he added ammonia to the nitre, or things of that kind, to stimulate the constitution and give a little help to the animal. He also recommended a blister; and the second bullock received no other treatment than a large blister on the side. That bullock was now doing as well as possible. His difficulties did not end with these two bullocks. Mr. Gurdon proceeded to state, in detail, the losses he had sustained in five lots he had purchased since Michaelmas twelvemonths, showing there had been a very considerable sacrifice. The third lot never went down to the marshes at all; and here was the only fact to which he could point for a conclusion to be derived from it, as it was the only lot that had been free from disease. He thought it best that they should not separate that evening without this subject being brought under notice, and therefore he had purposely stayed after the chairman left, for he thought it desirable to see if any information could be drawn from any of the members. The fact he had already mentioned was the only thing symptomatic of cause and effect. When his meadows were under water, he sent for the engineer of the Eastern Union, and, by cleverly adjusting the levels, they got the water off, conveying it higher up the river. He had the misfortune of having a mill stream near by; and every one farming in the neighbourhood of such stream knew the curse of it. On the other side were wealthy proprietors, who he did not think spent very much on their meadows; but the singular thing was that, though their bullocks lived, as it were, in the water, while his were on dry land, they were well and his were ill. Some people suggested that he took too much care of his bullocks. They lived in sheds in the straw-yards; and instead of being, as his neighbour's bullocks were, like rampant lions on a sign-board, they were carefully penned up in their yards. He was inclined to think that the others might run the pleuro-pneumonia off.—Mr. T. Hawkins said, perhaps no farmer in the room had suffered more from the disease to which Mr. Gurdon had alluded—the pleuro-pneumonia in cattle, and that other disease which he had mentioned as just now so rife amongst the flocks through Suffolk, than he had. Mr. Gurdon had said that a farmer close by his had lost four or five score lambs; he thought he knew pretty well to whom he alluded, but he fancied the loss was between nine and ten score since Midsummer. He (Mr. Hawkins) looked over that flock in the beginning of June, before the lambs were taken off, and never saw better-looking ones; and he rather envied him for having beaten himself, though he had kept his the best. He beat him in the end by giving them artificial food, which certainly seemed to ward off this disease, which was a very peculiar one. He himself last year lost between seven and eight score lambs by it, but this year only about a score—not more. Last year when they met he told them what he thought the disease was owing to, but was disposed now to alter his opinion, and to think that what he referred to had nothing to do with the disease, as he found from experience that it would break out under all circumstances. He supposed it was from his shepherd having kept them too long on white clover, but that was not the case; for they found the disease equally among thriving lambs as amongst poverty-stricken and half-starved ones. He had been talking with a gentleman now staying with Mr. Shorten, of Ipswich; he was a veterinary surgeon, and he appeared to think that the disease arose from the lambs being let out too early in the morning when the dew was on, and when parasitic insects were on the blades of clover and grass before the sun rose. He said that if they only put the flocks on when the sun was up, they would not have the disease; and he expressed his belief that the real secret was that those parasitic insects which destroyed the lambs were, during the time the dew was on the clover and in wet days, eaten with the food, and that this was the cause of the disease. When he first had his lambs attacked he went to Mr. Fenn, a veterinary surgeon in the neighbourhood, who had a most powerful microscope, and he took the stomach of one of the lambs, and put under it; and they therein discovered a number of small thread-like worms. They submitted other parts of the stomach to inspection, and could see the same thing everywhere; and Mr. Fenn said the moment the worm or whatever it was got into the stomach, it increased in an astounding degree, by thousands and millions. They could see long strings of eggs ready to be hatched, and when hatched the worms lived on the animals, and if their throats were cut there was not the least particle of blood in them. Professor Simonds came down to see him last year, and they killed two or three lambs. These worms sucked the blood, and inserted their heads into the coats of the stomach, and lived on the blood of the animal, which in three or four weeks died from exhaustion, not having strength to stand up against them. The only remedy he ever found out was the highest possible keep they could have given to them. Professor Simonds recommended him to give two dessert spoonfuls of turpentine and a wine glass of linseed oil, but the remedy was as bad as the disease, for if the lambs had the least cough at the time they dropped down dead at one's feet. The best remedy was the most forcing food, and a piece of colewort was best. He turned his lambs last year into a neighbour's coleworts, and he lost not one afterwards; he believed this to be the best panacea for this disease, because it got rid of the worms, which were the real cause of it. He mentioned the case of Mr.Rudland, who bought a lot of healthy-looking lambs at Ipswich fair, and lost 60 or 70 of them a week afterwards; he (Mr. Hawkins) bought the ewes, and they were doing well. This showed that it was not good or bad keeping that produced the disease, but that they would lose them under all circumstances. He found that his ram lambs, which had had greatest variety of food and had never been in the pastures, were the greatest sufferers, and none of them recovered till he got them on the coleworts. He had no doubts that Professor Simonds's advice to Mr. Gurdon was wise and judicious, for if once an animal was attacked with pleuro-pneumonia, if it were worth £10 or £12 it would soon be reduced to £4 or £5, while there would be a heavy veterinary bill to pay, and the animal would require much time to get to its former condition; therefore if it only realized £7 or £8 it would be better to sell at once. There did not appear any cure of the nose disease if it once got to a certain stage; if the lungs became hepatised and the air vessels stopped up, the animals must die. The butcher he was convinced was the best doctor in pleuro-pneumonia; he had never found that he could do so well as by getting the best price he could for the animal before the disease got into the system. His friend Mr. Overman, of Norfolk, had tried the homœopathic system of curing bullocks; he saw his brother at the Smithfield Club, and he told him that out of 50 cases not one had been lost. Mr. Gurdon would add to what he said before, that he was inclined to think that pleuro-pnuemonia might be treated, but it was the farmer's entire ignorance, and the ignorance of scientific men of the nature of the disorder, which prevented its being treated successfully. He should like to know what was the commencement of the disorder. He should like to see some course adopted to trace the disease in every possible stage, and find out what the first stage was, and what was the nature of it. From what he heard, the animal's standing with its head out, its eye wild, and refusing to eat, were the first intimations. Now he should like to kill an animal in that state directly; but it could not be expected that a single individual could bear the expense of such experiments, which he wanted to see carried out by the Royal Society on a large scale. He should like that Society to consider whether it was not worth while for them to vote some considerable sum for experiments on this subject. He wished to see a hospital where these animals could be treated; the moment one was seized it should be killed and examined, the same with an animal getting round, and beginning to feed, and even an animal which had been with it, and shown no symptoms of disease, should be also killed; by these means they might discover when and where the disorder commenced, and all possible experiments should be tried to gain information on the subject.

It will be admitted that the men of Hadleigh spent a very instructive evening, and one which would well bear the "morning's reflection."

THE PRESENT STATE OF AGRICULTURE IN ENGLAND.

On Tuesday evening, the 8th of November, an able lecture on "The Present State of Agriculture in England," was delivered at the Hall of the Scarborough Institute, by John Dent Dent, Esq. R. H. Tindall, Esq., presided.

Mr. **Dent** commenced his lecture by observing, that we could not wonder at the interest which, through all time, had been felt in agriculture, when we remembered that God had given man the earth for his subsistence, and that the consequent labour had been the source of every human blessing. The soil, which to sloth would only yield thorns and thistles, was to give the waving corn and the abundance of harvest as the reward of well-directed industry. Hence the Christian moralist and philosopher of every age had found no happier illustrations of divine truth, and no readier vehicle of instruction, than those which he could gather from the simplest operations of rural affairs. More than any others, the English poets, statesmen, and philosophers had made agriculture the recreation of their leisure, and had looked upon it as the mainstay of the nation to which they belonged. George the Third, and the present Queen, had alike encouraged and enjoyed the labours of the farm; while the most practical statesman of modern times, Sir Robert Peel, had not merely been a contributor to the Royal Agricultural Society's *Journnl*, but had carried out great improvements at Drayton Manor, with the same business-like spirit which had distinguished his political career. Still, interesting as the culture of land is to every class—to the merchant, the trader, and the artizan, as well as to those who are more directly occupied in it, such are the prejudices of the farmers, and many of the landowners of England, that we have no correct returns of agricultural production, and must content ourselves with a glance at operations, without being able to tell accurately their results. Drainage had been the great improvement of modern days, and had worked the most triking alterations in the strong lands, rendering turnip culture and sheep farming possible where bare fallows before were the rule. Mr. Dent gave a sketch of the systems of Mr. Smith, of Deanston, and Mr. Parkes, and quoted an extract from Capt. Blyth's work on water meadows, written during the Commonwealth, to show that even then there were some who understood the true principles of the subject, viz., that the object of the drains should be to remove the spring-water at the point where it meets the rain-fall, and stagnates under the surface; and that by placing drains at a depth of four feet, this would generally be best effected; and that so a warm, sound bed would be left, through which the rain-water might percolate, and the roots of plants gather all the nourishment which comes down from the atmosphere. The benefits arising from claying and marling the fen soils of Lincolnshire, and the improvements of the sands of Norfolk, the heath and the wolds in Lincolnshire, and the breaking up of the downs in the South of England, were then sketched as excellent examples of the exertions which landlord and tenant had made in permanent improvements. Draining, marling, and chalking, without manure, would not suffice to meet the exigencies of the present day. The production of what are called artificial manures, and the increase of food for stock, are the points to which the knowledge of the practical farmer, and the science of the chemist and geologist are most usefully directed. The spirited English farmer of the present day is not content with the feeding substances grown upon his own farm, and finds nothing which produces meat on his animals, and good manure in his yards, so readily as linseed cake. In one year, 1857, he expended in this article alone more than £2,000,000, whilst the imports of inferior grain, much of which was no doubt consumed by the agriculturists, amounted in the same year to £8,000,000. At the present time, also, the agricultural chemists declare that the cake made from the seed of the cotton plant is of equal value to linseed cake, but as great losses have occurred from the use of cakes made from the husk crushed up with the seed, great caution must be displayed in the choice of the best samples. In manures, no less than in food, the agriculturist's outlay has been considerable, and the aid afforded to him by the geologist and the chemist most remarkable. In 1800, Sir Humphrey Davy called the attention of English farmers to the guano, or deposits of dung of the sea fowls, on the coasts of Peru. But no importation of it took place until 1841. In that year, Mr. Myers imported twenty casks of it into Liverpool, and since then the use of it has become so general, that in ten years ending with 1857 the English farmer expended more than £20,000,000 in its purchase. Bones have been even more extensively used as a fertilizer, and the discovery that their manurial property was increased by solution with sulphuric acid is due to Liebig. But we are not dependent only on bones to produce the great turnip manure, superphosphate of lime; for Buckland, and Henslow, and Paine found that the different geological formations were rich in fossil remains, and the analyses of these by Liebig, Lawes, and Solly proved their great manurial value. They now, under the manufacturer's hand, produce the commercial superphosphate of lime; and so the farmer carries to the fields which are too distant from his homestead for the farmyard manure, the dung of the sea-bird from the coast of Peru, and the fossil remains of the antediluvian world. But agriculture has benefited no less by the skill of the engineer and mechanic, than by the scientific research of the geologist and chemist. Although no implement has yet displaced the plough in the cultivation of the soil, and its preparation to receive the mellowing of the winter's frost, still much has been done towards assisting the autumn cleansing of stubbles by the broadshare and the cultivator. By the use of these the farmer is now able, in the southern counties especially, to destroy the couch grass during autumn, and bring his fallow-land into the fittest state for turnips in the spring. Other implements have made equal progress; but the great problem of modern agriculture is the application of steam to the cultivation of the soil. If this can once be successfully carried out, the mine of wealth which exists almost untried in the clay lands of England may yield up its resources, and the clays may become as much sought after as are now the light lands. At present, the wet weather of autumn usually prevents the clay-land farmer from cleaning his stubbles, ploughing in his manure, and sowing his wheat with the ordinary force of horses sufficient for the farm. But if steam comes in to his assistance, these operations will be performed; and the land will be left ready for winter under the most favourable aspects; and we may expect from it heavy crops of corn, and even of mangold wurzel. At present, two different principles of steam cultivation occupy men's minds—one in which the steam shall drive the locomotive, and itself work a rotary digger, preparing the seed-bed at once for the corn; and the other in which steam only supplies a motive power to implements now existing. Although the principle of the first is apparently the most correct, its application hitherto has not been practically successful, the complex nature of the machinery, and the cumbrous weight of the implement, impeding its operation on the soil. Two implements on the other principle have each achieved well-merited success—one manufactured by Mr. Fowler, the other by Mr. Smith, of Woolston. The former performs its work as the old plough did, inverting the soil; the other by means of a cultivator, breaking it up and pulverizing it. The tenant-farmers of England have not been slow in recognizing the merits of these machines; and, in spite of their great original cost, and the heavy expense of their wear and tear, several of each kind are now at work on farms in different parts of England; and the farming world are looking forward in sanguine hopes of great results being produced by them. There is still much room for improvement in the simplicity of their construction, and in the diminution of their cost. Steam has, however, asserted its supremacy in other departments of the farm; and Mr. Dent gave several details connected with the steam thrashing-machines, for which he was indebted to Messrs. Clayton and Shuttleworth, of Lincoln. The reaping machines next occupied attention; and their progress was traced since 1851, and an opinion expressed that Messrs. Burgess and Key, Crosskill, and Cuthbert could each now supply implements such as the tenant-farmer might buy with confidence. Mr. Dent then expressed his regret that agriculture was the only branch of industry in which the inquirer was ignorant of the results that had followed upon enterprise; that, though every one could see droves of oxen and flocks of sheep fattening on land which once barely supported a few geese or a starving donkey, and though turnips and grain now grew where formerly the flag and the rush waved, and crept year by year up the moorlands and downs of England, still no one knew how many acres we cultivated, how many quarters of corn we produced. The statician, deducing wonderful laws, which seemed to govern the whole universe, from correct figures on every other subject, was at a loss when he took English agriculture in hand; and the producer and consumer were alike wanting in the knowledge of what one could supply for the other's wants. Regretting that time would not allow more than a glance at the botanical discoveries, the history of the flocks and herds, the discouragement of disease, and changing seasons, Mr. Dent said there were yet many improvements needed. One still saw bad farm-buildings, great spreading hedgerows, with their accompanying timber; estates overrun with hares and rabbits, and the turnips and wheat bearing testimony to these plagues of a farmer's life; ill-bred cattle, bare fallows, and, more than all, grass land neglected and not cared for, and good farming unfortunately not yet the rule. In social position and intelligence, the farmer of the present day has made as much progress as he has in the cultivation of the land. You will find in the farm-houses of the highly cultivated farms in Lincolnshire, Yorkshire, and Norfolk, elegant women and men of mind, yet fully informed and able in their profession. There was at one time fear and regret expressed at the prospect of the race of small farmers dying out. Mr. Dent said he could not share in that regret; as a rule, the small farmers had been men of small means and small education—but little removed from their labourers, and oftener sinking down to the class below, than rising to that above. The idea of their entertaining more sympathy and more fellow-feeling for their labourers had been disproved by experience, and the higher the land was cultivated the better was usually the condition of the working population. Referring to the condition of the labourer, Mr. Dent expressed his thanks to, and made several quotations from letters of gentlemen residing in different parts of England, containing much valuable information on the subject. The effects of the law of settlement, he showed, had been to banish labourers from the close parishes, to the injury of the farmer as well as of themselves; that the farmer suffered from the distance at which his labourers resided from their work, and the extra toil imposed upon them by their morning and evening walk; whilst the labourer, driven away by the wealthy landowner, was the prey of speculators in the open parishes, and paid a high rent for wretched accommodation. Although landlords and tenants are now awakening to these evils, still they are unfortunately the great cause of sin amongst the rural population of England; and from every part of England, by clergy, farmers, and land-agents, the same testimony is borne as to the insufficiency of cottage accommodation for the purposes of ordinary decency. This is mainly a landlord's question, and one which many landlords are taking up, but on those who continue to neglect it a very heavy responsibility rests. Generally wages are improved, and work is more regular; even in Dorsetshire, and the southern counties of England, the same testimony is borne that wages are more generally paid in money; and the system of giving liquor in part payment is dying out, though this still is a great check to sobriety in some districts of England. Education does not seem to make so much advance as could be wished, and on this point there are many who entertain doubts whether our present schools are quite satisfactory. There is so much of practical education in the field, that one may sometimes question whether the children are not there learning the best lessons of their daily life. Besides, the children's wage is so important a portion of the weekly earnings, that parents are naturally tempted to grasp the present good, rather than the future benefit of education. Is there not also much in what Mr. Norris (one of Her Majesty's inspectors of schools) says as to school-teachers: "The ignorance of agriculture, and indeed of nearly all the subjects connected with country life, betrayed by the young teachers that now come from our training-schools, is deeply to be regretted. No book-knowledge of chemistry, or of the theory of agriculture, compensates for the want of familiarity with the actual routine of farm and garden work." After expressing his regret that we were still disgraced by the hiring of farm-servants at statutes, and denouncing the hideous sin and dissipation by which they are characterised, Mr. Dent thus concluded his lecture: I speak warmly of these statutes, and I have been told that I am one of those who would deprive the poor farm-servants, who never sees any change, and leads a life of monotonous labour all the year, of his only holiday, where he may meet his friends. Not I, indeed! There are plenty of opportunities, and we might easily make more for rural merry-making and social gatherings. Every village in the north, that I know, has its old annual feast, too often, formerly I own, a scene of drunken jollity, but which might be made a time of pleasant family gatherings and happy meetings, if we had fewer ale-houses, and if those in a higher rank would not stand aloof, but join in the amusements of their poorer neighbours. And both this year and last, successful efforts have been made to have harvest-homes on a large scale, when a day, commenced by thanksgiving to God for his bounty, has been closed by a happy afternoon, with plenty of good cheer and merriment for all. I was much pleased to see it stated that at several of these meetings, where the men had as much ale as they liked, there were few, if any, intoxicated; they were too well amused to wish to drink, and this is what we should aim at in our village-feasts and harvest-homes, by giving men plenty to do to occupy their bodies and their minds so well that they need not drown their senses in liquor. Far better this, than meetings to give premiums for long services; and if the farmer will but try to make his farm more comfortable for his servants, and, without lowering his own position, take a more active and kindly interest in their welfare, we shall hear less of these annual partings, and there will be more care and interest taken in the master's work—more happiness and virtue in the servant's life.

THOROUGH-BRED DEVONS.—VISIT TO THE WAINWRIGHT HERD.

"The Meadows" is the name appropriately bestowed upon his stock-farm, near Rhinebeck, N. Y., by Mr. Charles S. Wainwright, one of our most prominent Devon breeders. Beautifully situated upon the eastern bank of the Hudson River, in a healthy region well wooded and watered, with the soil naturally fertile, the farm is both especially adapted to the purposes of the stock grower, and attractive to the country gentleman.

It comprises 340 acres of land, the greater part of which is a heavy clay, resting upon a yellow clay subsoil, that is, perhaps, 20 feet deep, and which so tenaciously holds water that a thorough system of under-draining is needed to elevate its temperature, and make it permanently productive. These heavy clays, when drained, are generally found to be the most valuable lands, not only for grain crops, but for meadows and pastures as well; but if the excess water be not removed, evaporation from the surface in spring reduces the temperature so as to check the early growth of the crop; organic acids are formed, which promote the growth of sorrel and other weeds, and act unfavourably upon grain; while in summer, the excessive evaporation of water causes the ground to open in a multitude of cracks; and in winter, the water in the tenacious soil being rapidly frozen, and as rapidly thawed, the crop is thrown out, and often seriously damaged.

Of the 340 acres in the farm, at least 200 lie in one body, as smooth as a western prairie, and all laid down to meadow —from which circumstance the name of the place is derived. No piece of land could be more suited to the mowing-machine; for the surface is free from stones, not cut up by ditches, and the grass throughout the whole tract is generally even and luxuriant. On the occasion of our visit a portion of this meadow was being ditched for tile drains, of which Mr. Wainwright has already laid five miles, in addition to the same length of stone drains; and he is now about putting down 10,000 tiles as a first instalment on the westerly portion of the meadow. It is, we believe, his intention to extend the system of thorough drainage over the whole place, doing a certain portion each season as his force of men may be at leisure. The stone drains were laid some ten years ago, when tile could not not be obtained nearer than at Waterloo, a distance of 300 miles from the farm. The opening of the ditches is greatly expedited by the use of a surface plough, and Thomas's draining plough—a simple but effective subsoiler that disturbs the soil at a depth of twenty inches or so beneath the surface. In half-a-day, with two men and two pair of horses, Mr. Wainwright started drains for 9,000 tiles, one spit deep, leaving the remainder to be dug with the draining-spade.

Two acres of land are devoted to the production of roots, for the winter feed of the stock. The produce of the two acres had been as high as 1,200 bushels, and might be made still more. The manure used is common barn-yard; but for seeding oats and wheat, and top-dressing grass, guano is applied, to give a good start to grain in autumn and grass in spring, because of the cold, wet nature of the land, which has a tendency to retard their growth.

In England, the farmers on heavy clays have of late years universally adopted a "clod-crusher" for pulverizing the lumpy surface of their fields, and making it into a good seed bed. Received, at first, with the characteristic prejudice of Englishmen against any innovations, the cumbrous machine has crushed opposition, and rolled its way into general favour. This has not been accomplished in a short time; it has been the work of years: and yet, while we have millions of acres of heavy clay lands that are excessively hard to plough, harrow, cultivate, and hoe, there are scarcely two-score of clod-crushers in use among us. One was sent out here to the New York World's Fair by Crosskill, but returned unappreciated, although it doubtless was seen by hundreds of farmers to whom it would have proved a treasure. Well, the moral of all this is that Mr. Wainwright was not insensible to the virtues of this clod-crusher; for when, in 1851, he heard that Mr. Thomas Burrall, of Geneva, had determined to get up a set of patterns, he straightway ordered the first crusher, and thus had, we think, the honour of being the first to use the implement in this country. He now says he has received so much profit from its use, that if unsupplied, and one could not be procured here, he would send out to England and buy one, even at the English price of 200 d. The American price of the machine is only 50 to 60 dollars, and on a clay farm it will crush the clods so as to leave no lump as large as a hen's egg. On a piece of winter wheat at "The Meadows," strips of land were "rolled" and "crushed" in alternate pieces, to test the merits of the clod-crusher. The result was that, until the ground was covered with snow, a person could readily distinguish from a distance even the lands that had been "crushed," from the much greater luxuriance of the crop. The crusher weighs about 1,000lbs., and consists of twelve coarse-toothed rollers about 3 feet in diameter, revolving with a shaft that turns in the frame to which the horses are attached. The rollers are a few inches wide on their rim, and cast heavy enough to be durable. The whole machine is about 8 feet in width.

Mr. Wainwright is a young man, and his career as a breeder goes no further back than ten years; but he has made the best use of his time, and achieved very flattering success. During these ten years he has exhibited eighty head of stock in competition for prizes at our national and State agricultural shows, and at those of the American Institute. For these animals he has taken no less than *fifty-three premiums*—the best possible test of the excellence of his stock and his judgment in their management.

In adopting the Devons to breed, Mr. Wainwright has argued that in this country there is a very large proportion of land—much of it of a hilly nature, especially in the older States—that yields but a scanty pasturage. The Devons in such pastures in England are found to be good rent-paying animals, furnishing good milk and beef, and first-rate working cattle. The beef is of a fine quality, and brings a high price in the markets. They withstand extremes of temperature. On a poor pasture they, from their peculiar build, are enabled to travel rapidly over the ground without fatigue, and get sufficient nourishment, where a heavy Shorthorn or Hereford would starve. The breed will average of a better quality and more even than Shorthorns, although the best Devons are not equal in weight to the best Shorthorns. The very best of this splendid breed are the best in the world; but below this summit of excellence we find them varying very much, going from all grades of quality down to the very poorest. Devons being an older-established breed, possess general constitutional characteristics that render them less liable to deterioration than an artificial breed like the Durhams; and hence we find, as we above remarked, that the herds of Devons, here and elsewhere, will average of better quality than perhaps any other breed.

As an evidence of this uniformity, we may mention that it is only within the last fifty or sixty years that systematic attempts at improving the breed have been made; for from the earliest records the stock has been nearly or quite the same as it is at the present time, the types having been perfectly fixed, and so excellent that it was thought impossible to improve them. In time, however, the demand for Devons from other counties withdrew the best specimens from their native district, and if it had not been for the efforts of Mr. Francis Quartly, of Molland, the breed might have become sensibly deteriorated. He, perceiving this continual export of the best animals, determined to make such selections of those remaining as would enable him to preserve, and perhaps elevate the standard of his native county. His efforts were crowned with the most gratifying results. By skilful breeding and careful selection he produced a herd of Devons wonderfully superior to any in the country, and his stock is at this day considered the standard of excellence. About the year 1831, cattle shows began at Exeter, and in 1835, Mr. Quartly's stock entered in the twelve classes, swept the field, and gained the twelve prizes. In 1850, at the Royal Society's Show at Exeter, ten prizes were offered; seven of these were awarded to the sons of Mr. Quartly, and two to animals bred by them, but exhibited by other persons, leaving but one prize to breeders of other strains. Mr. George Turner, of Barton, near Exeter, deriving his stock from the Quartlys, Davy, and Merson, has achieved a complete success, and now ranks as one of the best breeders in the Kingdom. At the Royal Society's Show at Chester he gained three of the prizes, and several "high commendations" in the different classes; and at the Bath and West of England Show, held at Barnstaple on the 1st of June in this year, he and his stock very nearly swept the field.

When, therefore, we know that Mr. Wainwright studied the art of breeding on the farm and under the immediate tuition of Mr. George Turner, and of him procured his original stock to commence the herd at The Meadows, we naturally expect that on the banks of the Hudson we shall ultimately see as fine a herd of Devons as are to be found on the banks of the Taw. If Turner, with Quartly's stock, has at times gained the prize over Quartly, why, with Quartly and Turner stock, and Turner's teaching, should not Wainwright turn the tables on Turner, and improve upon him? We think there are evidences at Rhinebeck that he will. We saw Turner's stock at Chester last year, and think them inferior, especially in the rump, to some that Mr. Wainwright has produced. Turner's three-year-old bull, The Zouave, was exhibited by Prince Albert, and gained the second prize; but he would not compare in quality, beauty, or general symmetry with Horicon; and Prince Leopold, Turner's eight months' calf, that took the first prize in his class, was not so good an animal in every respect as Sachem. In fact, so convinced has Mr. Wainwright been of the merit of his own herd, that he has made scarcely any importations of late, the last, *Omar Pacha* and the heifer *Daisy* (640), having been brought over in 1855. Omar Pacha was purchased as the winner of the first prize of the Royal Society (which is the same as saying he was the best bull in England), at Carlisle, in 1855. He stands in the same stable as Horicon, so a fair opportunity is afforded for comparison. Now, Horicon was bred by Wainwright, his sire being May Boy—a Turner bull imported in 1851, and bred by the Duke of York, that won royal first prizes as a yearling, and afterwards as an aged bull; unless something has been produced in England to beat Omar, Horicon, if exhibited at the Royal Show this year, would take the first prize, for he is a much superior animal in quality, weight, and head. Noe is the daughter of Helena, a cow bred by a widow lady, by her sold to James Quartly, and purchased of him by Turner for Wainwright in 1848, when he commenced his herd. She was so regular a breeder, of such good quality herself, and her calves reproduced so exactly her good points, that Mr. Wainwright determined to found a family, and has now got to the seventeenth of the name. They are distinguished for their quality and the excellence of their hind-quarters. Devons generally fail in the rump, and even between the best animals of other blood in this herd and the Helenas, there is such a difference to be observed that it is not difficult to select the latter, even with a cursory examination. The old cow gave twenty-two quarts of milk, and Helena 3rd, at four years of age, gave ten quarts per diem, beside what the calf took. As a three-year-old, she raised two calves at the same time. This is rather more than can be said of Herefords or Shorthorns, for it sometimes happens that three or four cows are appropriated to one lusty calf. Horicon, taking the good points of his sire, Meganticook, has in addition some of the Helena quality, and the rump for which they are chiefly distinguished.

CARE OF STOCK.

In Devonshire the calf is permitted to suck three times every day for a week. It is then used to the finger; and warm new milk is given it for three weeks longer. For two months afterwards it has plenty of warm scalded milk, mixed with a little finely-powdered linseed cake. Its morning and evening meals are then gradually lessened; and when it is four months old, it is quite weaned.

Mr. Wainwright's practice is different. He allows the calf to suck morning and evening until it is four months old, it never running with the cow. When one month old, a little meal is put in its box, so that it can nibbled at it, and, when weaned, be prepared to eat without losing in flesh. Spring heifer-calves get meal the first winter, and none afterward; fall-calves for two winters, because they are, of course, so small that they eat but little. They are fed when quite young, so that they may acquire a stout, robust constitution, and have a fair start, after which they thrive well on hay and roots. Bull-calves are of course fed higher, as the object is to get more size than with females. The animals are curried in winter, not only to keep them clean, but, especially with bulls, to make them gentle.

EARLY IMPORTATIONS.

In 1817 Mr. Coke (afterwards Earl of Leicester), of Holkham, England, gave to Mr. Robert Patterson, of Maryland, six Devon heifers, and a yearling bull named Taurus. Three of these heifers were given to Mr. Richard Caton, and the remaining three to Mr. Patterson's father, Robert Patterson, the bull being the joint property of this gentleman and Mr. Caton. In 1835 the herd of Mr. Robert Patterson became the property of his son George, who, wishing to introduce some new blood, wrote to the Earl of Leicester to purchase a bull for him, which was done; and Anchises was sent over, and used upon the old Taurus stock. The descendants of this cross are now scattered over the whole country, and have done a vast amount of good. The above particulars are contained in a letter by Mr. G. Patterson to Richard Peters, of Georgia, published in the second volume of Davy's "Devon Herd Book." We saw some of this Patterson stock at Mr. Peters's place two years since, and thought them very fine animals. Mr. Peters had crossed some Devons with a Brahmin or Hindoo bull, and was of opinion that he would produce a race of animals of value to Texan and other southern farmers. He had tried breeding shorthorns, but thought them not so well calculated for warm climates as Devons; and he had, consequently, disposed of them, and confined his attention to Devons.

POINTS.

In the scale of points adopted by the New York State Agricultural Society, for the guidance of judges, attention is called to the peculiarity of shoulder which distinguishes the Devon from other breeds. It should, in degree, approximate to the shoulder of the horse, taking a more sloping position than is found with other breeds, with its point less projecting and angular, and the blade-bone more curved, thus blending with and forming a fine wither, rising a little above the level line of the back.

Devons are distinguished for delicate limbs, deep red colour, beautifully-tapering horns, high and spirited action, docility in the yoke, and, as Mr. Randall says, "a show of blood little below that of the thoroughbred horse." On light soils they are especially useful for ploughing; for they have a remarkable quickness of step, and energy, that carries them over a great deal of ground in a day. For heavy soils, however, they do not possess weight of carcase enough to compete entirely with Herefords and Durhams. If a Devon can be bred to have greater weight, and still retain all the present excellent points of the race, the breed will be by far the best at present known. Perhaps this desirable result awaits the efforts of Mr. Wainwright, or those of Mr. Faile.

BULLS.

Omar Pacha, the Turner bull previously alluded to, is the only Royal first-prize Devon that has crossed the Atlantic. He is a very fine animal in many points. He has a better flank than is usual with this breed, a good upper line, broad, flat back, wonderful bosom, very fine bone below the knee, but his head is a little long and feminine, and he is undersized. He is an easy keeper, being now in fine condition without meal all winter, having had but six quarts of roots a day. His age is five years; weight, 1,470 pounds.

Horicon, his rival in the affections of the herd, is but four years old, and a real native American. His quality is good—better than Omar's. He is more cut up in the flank, and longer-legged; heavier too, for he weighed 1,820 pounds two months since. He is the largest Devon bull we recollect to have seen. His head is shorter and more bull-like than Omar's; his horns are set on close, which itself would give a heavy appearance to his head; but in symmetry throughout, his head is superior to that of the other. He is remarkable for carrying the loin so far forward as he does, and he has a great girth.

As we are speaking of girth, perhaps it will be as well to lay before our readers the table showing the average size and girth of prize cattle at the Royal Chester Show, prepared for the Society by Mr. Robert Smith. It would be well if such a one were arranged at each of our great agricultural exhibitions, for we should then know whether breeds deteriorate in this country, and if so, which?

Class.	Av. age of prize animals.		Av. girth of prize animals.	
Shorthorns.	yrs.	ms.	ft.	in.
Aged bulls	4	7¼	8	3½
Yearling bulls	1	9½	7	2
Bull calves	0	9¼	5	8
Cows	3	9	7	10
Two-year-old heifers	2	5	7	4½
Yearlings	1	4	6	5½
Herefords.				
Aged bulls	4	5	8	3
Yearling bulls	1	10¼	7	0½
Bull calves	0	10¾	5	11½
Cows	7	8	7	2
Two-year-old heifers	2	7¼	7	4½
Yearlings	1	9½	6	6½
Devons.				
Aged bulls	3	6	7	5
Yearling bulls	1	6¼	6	2
Bull calves	0	8¼	5	2
Cows	6	2½	6	9¾
Two-year-old heifers	2	6	6	10
Yearlings	1	7¾	6	1

Now, let our farmers on poor pasture farms carefully examine this table, and see which breed seems best suited to their circumstances. Here we find the aged Devon bulls, when a year younger than the other breeds, girthing only 10 inches less; and in other classes the difference is even less. Now, recollecting the build of this breed, and its superior qualities, does not this table go far to substantiate the claims of Devon breeders as to the peculiar province of the breed? We think it does. But to return:

Sachem, a seven months' calf, by Horicon out of Helena 2nd, is a growthy thing, rangy, with a good shoulder point, good flank and hind quarters, and as pretty a head as was ever seen on a Devon.

Wisconsin is young, vigorous, and promising; he has a good flank, and his sire's head. He and the other animals are healthy and hardy. Of forty bull calves bred at The Meadows, but two have been sick; and for three years past, with a herd of about thirty animals, male and female, Mr. Wainwright has had no sick animal on the place—a fact which speaks very favourably for the breed.

The original Helena was imported ten years ago, and from her there have been 40 descendants—25 heifers and 15 bulls. The same general points distinguished them throughout, each one of course varying somewhat from the other, but all having so marked a resemblance, that in a pasture lot, where there were 16 cows and heifers, it was not an easy matter for even their owner to select one Helena from another.

Helena 6th is rather more beefy than the others, and from the rump to the back she has more of a Shorthorn than Devon shape. She fails somewhat in the flank, but has a remarkable loin and crops. Her weight is about 1,220 lbs.

Kate Kearney was the second prize at the Lewes Royal Show. When she first got over here she was in such flesh that she slunk her calf, and it required two years to get her into breeding order. Since that time she has bred regularly, dropping three bulls and one heifer calf in four years. Her horns are well set on, and she has a capital shoulder, but she droops in the rump, and does not make a show equal to the Helenas.

Editha (680), a four-year-old cow, by Megunticook, out of Moss Rose (904), by Duke of York, the great prize-taker, carries flesh remarkably. She has not had a bushel of meal since she was twelve months old, but she is fleshy, and, although now heavy in calf, it is easy to see that she has a beautiful spring of rib. Her back would make a good dining table for a small party, and will cut more sirloin beef than any Devon we ever saw. As the English butchers say, "she has more ninepenny, and less threepenny beef than any beast in the show." Editha has taken five prizes in this country, three of them from the New-York State Agricultural Society.

Meadow Lily, sired in England by Baronet, son of Quartly's Prince of Wales, was imported in the cow, her dam being old Helena. Lily is now an old flower, and has lost much of her bloom. She is nearly eleven years old, but has been a fine animal, and done most excellent service in her time. She is mother to five Helenas, all of which are first-class cows. For one of her daughters, Helena 2nd, her owner has twice been offered 500 dols.

Helena 7th, a three-year-old, and one of the prettiest in the herd, calved during our visit to the place. Her head is of beautiful shape, eye clear and sprightly, spring of rib excellent, and back and twist good.

Nora, the dam of Horicon, and of a very pretty heifer, Norma, has great length of quarter, and has transmitted her stylish head to her calves.

Helena 12th has great weight. She has in her two crosses of May Boy, and, without stuffing, she now weighs, at twelve months old, 600lbs., which is heavy for a Devon. Thorne's shorthorn bull, 3rd Duke of Thornedale, weighed 1,100lbs. the day he was a year old, but the weight of Grand Turk is 3,000lbs., and the young bull had therefore got only a little better than one-third of his ultimate weight during the first year. This heifer will weigh perhaps 1,200lbs. as an old cow, and she has actually got half her ultimate weight in her first twelvemonth.

Donna, out of the old imported Nonpareil, by May Boy, has wonderful crops, filled out quite even with the shoulders. Her whole fore-quarter is excellent.

Flora, out of Mr. Conger's Daisy, is a nice little thing, an improvement on the dam, but not quite up to the Helena mark.

Eva, sired by Horicon, and out of the fat cow Editha, won the first prize at Syracuse in the class of yearlings. She comes of the old Nonpareil stock, her grandam Moss Rose, being a daughter of the old cow. Eva is a very pretty animal.

Helena 3rd is a showy, large cow, a good milker, with a beautiful head and a good loin. She was awarded the first prize at the United States Show at Philadelphia, in 1856.

We learn that a considerable demand is springing up for Devons to go to Mississippi and other Southern States, and more recently numbers have been sent across the plains to California.

We noticed in the cow stables, at Mr. Wainwright's, that alongside each grain-box there is a small box for salt, in which a lump of rock-salt is always kept. The animal, being thus left to choose her own portion of the condiment, takes as much only as her system actually needs.

The cows are tethered by chain collars, tied to the manger by a rope, passing through a hole, and held at the end by a wooden block. The rope is used because, in case of fire, it could be cut in a moment, and the animal freed in much less time than if the chain were of the usual length, and sliding on a bar.

Among the leading breeders of Devons in this country, besides Mr. Wainwright, are E. G. Faile, of Westchester County, New York; George Patterson, J. Howard McHenry, and Odin Bowie, of Maryland; Horace Capron, of Illinois; and Richard Peters, of Georgia. Mr. Patterson's stock has been bred for milk almost exclusively, and he has offered to milk it against any breed in the country. He is the only person in the United States who has gone into the importation and breeding of Devons as extensively as Mr. Wainwright. Mr. Capron has had the Caton stock from the old Patterson importation, but has recently purchased of Mr. Wainwright his imported bull, May Boy, and is breeding him to his stock with good success. Mr. Capron's herd we saw at the National Fair at Chicago, a few weeks since, and thought they excelled in beauty anything of the kind we had seen. The old bull May Boy was there, and showed fine condition. On the black soil of the prairies, where speed is more an object than thoroughness of work, the Devon ox must surpass all others. It is said to be nothing unusual for four steers to plough two acres a day, and in catching weather, when the Devonshire farmers are getting in their hay, the cattle will be trotted along the road at the rate of six miles the hour! We learn from Youatt that in their native county they are worked lightly on the hills for two years, and are then bought at four years old by the farmers in the valleys, by whom they are put to hard work until they are six. It is worthy of notice that unless put to this hard work they are liable to become stinted in their growth.

Satisfactory experiments are on record which prove that the Devons possess the propensity to fatten in an eminent degree. They do not, perhaps, attain to such great weights as the Shorthorn or Hereford, but in a given time they acquire more flesh, and with less consumption of food than, perhaps, any other breed, and their flesh is beautifully marbled.

We cannot conclude this notice better than by quoting a remark made by a leading Shorthorn man to Mr. Robert Smith, at the Chester Show last year. He said: "I find we Shorthorn men have got much to learn of the formation of animals; their beautiful contour and extreme quality of flesh surprises me." This remark was made when going over the Devon cow class.—New York Tribune

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THE MYRE-MILL AND CUMMING-PARK FAILURES.

For the while we had a brief sojourn at Myre-mill in the county of Ayr. We have before stated our great disappointment in everything we saw at this noted farm. Expectation might have been raised too high; our notions of high farming, as given by the pen of ready writers, might have taken more of spade or of garden cultivation than was really useful or practicable. In our state of continual pupilage we had hoped to have seen something to copy, or heard something worth hearing. We did neither the one nor the other. We heard of nothing but failure and pecuniary losses; we saw nothing but desolation and neglect, showing the folly of keeping stock in an unnatural and too artificial state of existence. Disease and death and consequent loss must follow those theories which are not based on—first, preserving the health of the animals; and, secondly, when in health, obtaining from them the greatest amount of human food. Much care is necessary to obtain all this, and it may be doubted whether horned cattle are really healthy when cribbed and cabined in stalls; having plenty of food, but no easy and comfortable bed to lodge on. This is sufficiently shown by the great number of cows in the hands of (town) dairymen having swollen joints, and the creamless quality of their milk. This was found to be the case at Myre-mill farm; the milk was poor and thin; the cream was very much like that usually found in London and other large towns; while the cheese was neither of Cheshire nor Derbyshire quality, but such as if given to ploughmen might have found its way as a wedge into a plough beam. Such was the result of the dairy practice at Myre-mill, and proving a failure, the cows have been released from their prison-house, and kept as cows ought to be kept. The change in the health and condition of the animals is for the better, and now Myre-mill can produce useful cheese and butter in the more natural way. And yet, in spite of the great failure of this system as practised by Mr. Mechi, Mr. Kennedy, Mr. Telfer, and others, the plan seems even now, in the sensible year 1859, to meet with friends. In the Journal of the Royal Agricultural Society recently publishd, there appears a long and laboured article advocating the liquid-manure system and the growth of Italian rye-grass. But some change is recommended, and instead of flexible hose, a machine on wheels is constructed to assist the distribution of the liquid over the surface. All this, in the eye of practical men, is a fallacy, its chief recommendation being, that it does not in this instance proceed from the fertile genius of Leadenhall-street. It is well known that this plant, so rapid in its early growth in the spring, is a biennial, and of no use after the second year. In truth, it is of little use during the second year, having no power to tiller, and standing on one leg only, more especially if the plant has been mown and not pastured. Useful as Italian grass may be for ordinary pasturage, it cannot be considered a permanent grass for the purpose of irrigation. In this respect it is greatly inferior to the common and natural grasses. It is strictly a cereal, and has always been classed as such. To expect to grow wheat or oats from stubble, would be as reasonable as to expect a continuation of Italian grass after mowing green, or after shedding its seed. Whatever may be the failure of the tank system as regards cows, it is still greater with sheep. It is to these animals a cruelty—a something so unnatural and so filthy, that it is difficult to understand the object and meaning of keeping them in stalls. One object appears to have been to keep them warm, and by so doing to reap two crops of wool annually. This was a failure; for the sheep being kept warm, nature did not put on the necessary covering to protect the poor creatures from the cold. The wool, therefore, lost its staple, its strength, and quality, and was unsaleable in the market. But what could be said of the mutton? It was *hybrid*, between veal and pork, and had no venison quality. The little fat was lardy, and the lean ought to have been given as food to those who invented the system of stall-feeding sheep. We must now leave Myre-mill and its fallacies and failures, and tramp on eight miles to Cumming Park, near the pretty town of Ayr, and through a beautifully undulating and romantic country. This farm is in the occupation of the owner, Mr. Telfer, who had copied the Myre-mill tank system, and the keeping of cows in stalls. That gentleman had not, to his great credit, made any preparation for stalling sheep. Rather than do so on a fine turnip soil, he considered it wiser to keep *no sheep on the farm*, but to devote it entirely to dairy purposes. Perhaps no better plan could have been devised to make the undertaking profitable, considering the proximity of the farm to a large and flourishing town, and there is little doubt but it would have paid, had the cows been kept in a natural and proper way; but the cows were not so treated in the outset, and the theories and absurdities of Myre-mill were carried out with still greater absurdity at Cumming Park. On a farm of 50 Scotch acres, a house was built to accommodate 48 cows; 24 on each side. The tank system and liquid manuring was to be adopted, the land having been piped, so that, by means of flexible hose, the liquid could be distributed as required. Mr. Dickenson, who some time ago published a short essay on "Italian rye-grass and liquid manuring," ventured to quote Myre-mill and CummingPark as remarkable instances of the success of his system, and appeared to claim for himself the credit of having introduced an improved and peculiar breed of Italian grass, grown only by himself.. Mr. Dickenson, as a vendor of grass seeds, might be right in advertising his goods; but how far he was right in recommending his system and showing large profits, the sequel has shown. The owners of the farms in question have great reason to regret having adopted high-farming as their rule, and its utter failure and abandonment is sufficient evidence of itself to prove the pecuniary loss attending it. Some description of the cow-house at Cumming Park may be interesting to agricultural readers, if it be only to show how much foolish money can be thrown away in making poor cows miserable. The approaches to the farm-steading from the "banks of bonnie Doon" and "Alloway's Auld Haunted Kirk" are very beautiful, and the mind seems prepared to realize all that has been told and written of Mr. Telfer and Cumming Park. The illusion, however, is of short duration, and the first thing to be noticed is the *debris* of its once boasted fame. Here may be seen in rusty confusion and neglect every kind of implement—good, bad, and indifferent—from Howard's ploughs downwards to the most useless and impracticable things ever invented. The cows *drawing*-room was deserted, but there were some curious pictures left inside. The cows (only eleven) were pastured in an adjoining field, and were no doubt happier and more contented than their predecessors had been in the grand lodgings Mr. Telfer had provided. In this apartment the first thing which took our attention was the absence of straw as a layer; the cows were not permitted to lie down on this common and vulgar bed; they had a material prepared for them called cow-carpeting, each having a carpet provided about the size of a common hearth-rug, extending the width of the stall. This carpeting was, of course, Scotch; it was not the production of Wilton or Kidderminster, but made of hemp and cocoa-nut fibre, and looked more comfortable than the bare stones of the byres at Myre-mill. The bottom of the gutter was laid with cast-metal perforated tiles, to carry the urine down to the tank. The walls of the place were drawn, and appeared as if intended for paint or paper; while the lower part, four feet high, was lined with a fine black slate having all the appearance of marble. The building was slated; but the slates were too cold in winter and too hot in summer. To preserve a uniformity of temperature, the under-side was boarded and afterwards drawn to correspond with the side-walls. Arrangements were made for throwing the place into complete darkness, so that the cows, after being fed, might be cheated out of daylight into midnight, and coaxed into an unnatural slumber. To light the place with gas was nearly impossible, or it might have been done, so as to divide the 24 hours into several days and as many nights. All this was done for cows, that did not and could not appreciate, and nothing was done for the cottager, who would have been thankful for some additional comforts to his dwelling. The "bonnie lassie" of a dairy-maid, hale and strong, appeared to be doing all the work with £5 a year and board and lodgings. She was a plumpy, lumpy, tidy lass; her dairy was clean, and her face and feet were clean; her legs and arms the colour legs and arms ought to be, and like the fabled "fox and grapes," she nobly despised shoes and stockings. We have entered into a more lengthened account of Scottish husbandry than we had intended; at the same time we only write down what we saw during our inspection and journey. Scotland is a hundred years in advance of England—in self-laudation; but she is more than a hundred years behind England in her husbandry.

A NORTH DERBYSHIRE FARMER.

SHEEP AND SHEEP-FARMING IN NEW ZEALAND.

Of New Zealand, some thirty years back, but little was known. Schoolboys were then taught that Captain Cook had discovered an island to which this name had been given; and it was very generally understood to be peopled by a fierce and athletic race, more or less cannibal in their habits, continually carrying on a predatory and internecine war, and generally inclined to act in a hostile manner towards English intruders. Here, however, all information ceased; the sole people who felt an interest in this *terra incognita* being missionaries and whalers, the latter of whom found the coast peculiarly suited for the formation of stations, and by whom, it appears, a very profitable business was then carried on.

Of late years, however, it has so increased in importance, from the discovery of its mineral wealth, and it is so peculiarly adapted for the production of sheep, that at the present day probably few countries offer greater interest to the inquiring and intelligent mind. It is composed of three islands, the North, the Centre, and the Southern or Stewart's Island. Of these the central one—eventually destined to take the lead—is divided into the Provinces of Nelson, Canterbury, and Otago.

Without entering into a consideration of the various local peculiarities of each, it is sufficient to state that the whole island is of a pastoral nature, and, although the northern district may complain of overabundance of timber, while the centre is so destitute of this necessary as to make even fire-wood an expensive article, and the extreme south is too wet; yet these drawbacks are so amply counterbalanced by the richness of the pasturage and the plentiful supply of water, as well as by the general mildness of the climate, that I believe no equal district of land in the whole world is more peculiarly suitable for sheep-farming.

The original stock imported, some ten years back, from Sydney and Melbourne, consisted of the very refuse of the New South Wales and Victoria flocks. The present Merino sheep of Canterbury cannot be contrasted with the earlier arrivals at Port Cooper.

That from time to time the introduction of superior blood has had much to do with this marked improvement, there can be no doubt, but it is certain that it must be mainly attributed to the sheep being in a climate suitable for its natural development, and where it has had an abundance of excellent pasturage. No longer exposed to the summer drought, and consequent lack of nutriment in the herbage of Australia, it has far surpassed the sheep of that country in quantity of wool and weight of carcass. There came under my notice a flock of wethers, raised in the Canterbury District, and forwarded to Christ's Church, that averaged, when dressed by the butcher, over 78lbs. each.

New Zealand is especially fortunate in having no natural enemy to the sheep; neither the wild dog (or dingo) of Australia, nor any other carnivorous animal, lessens the profit of the feeder; while the New Zealanders, or Maories, unlike the Australians, have never been given to the stealing of sheep, by which, in the early days of the colony, many a New South Wales farmer has met with heavy losses, and, in some instances, was compelled to give up his station. Whatever injury the colonists may have received at the hands of the New Zealand natives, was done in open warfare. At the present day they are an industrious, quiet, and manly race, chiefly supported by fishing and the raising of cattle, horses, pigs, corn, and potatoes, on their own lands. Many of them make excellent and trustworthy shepherds. In the north Island, where they are more numerous, it is by no means rare to come across natives of considerable wealth, and possessing a very creditable amount of business information.

It is worthy of notice that, in consequence of the tenderness of the grass, sheep live much longer in New Zealand than in Australia, the hardness and roughness of the pasture in the latter country during the summer months causing them to become "broken mouthed," thereby causing them to be sent to the butcher, probably two years earlier than in New Zealand. This with sheep of the Merino breed, which yield the most valuable wool, is of very considerable importance.

The great drawback to sheep-farming in New Zealand, in common with Australia, is the general prevalence of scab. Many a man with a moderate amount of capital has been ruined by this frightful disease—so virulent that a single scabby sheep will quickly infect the whole country. The scab had gained such ground in Victoria, some five years back, that a law was passed requiring the slaughter of all sheep affected by it (the proprietor recovering a very trifling compensation per head). Scab-inspectors were appointed by Government to see that it was rigidly carried out; but, notwithstanding this stringent measure, it still remains uneradicated.

The whole of New Zealand is more or less infested with it. The disease proceeds from minute insects, which attack the skin of the sheep, gradually burrowing and laying their eggs underneath. The affected parts in time harden, ulcerate, the wool falls or is scratched off, the sheep becomes feeble, and, if not cured, eventually pines away. To my own knowledge the contagion has been given to a perfectly clean flock while the purchaser was taking them to his own station—he having passed over land on which, some two months back, diseased sheep had been: the insects probably infected the wool that had either been left on the ground or rubbed off against the small shrubs. Indeed, the "run" ought never to be considered clean and thoroughly safe until after a continuous fall of heavy rain.

The scab is spread not only by infection, but will occasionally break out spontaneously from the over-heating of sheep; a careless shepherd will thus create an injury to his master that it may take years to overcome. For a long time there were used various powerful and dangerous remedies, such as corrosive sublimate, arsenic, and arsenical preparations. The latter were especially bad, from the large mortality among lambs, which, in sucking the ewes, would frequently be killed by the arsenic; and, after all, it generally proved an ineffectual remedy. The treatment now almost universally followed is tobacco-water and spirits of tar; and I feel certain that if it were properly applied, and the sheep were carefully kept from all infected ground after dipping, it would invariably prove effective. The manner in which I would recommend its application, is to have dipping-tanks built on three several parts of the run, where the ground is known to be clean, Immediately after shearing to dip each sheep in a tank filled with tobacco-water, with a dash of spirits of tar, kept up to that degree of warmth that the hand can comfortably be held in it (previously excoriating any especially hardened skin); move them to clean ground, and, after twelve days, dip again in the second tanks; following the same rule, after a like interval, at the third; after which the sheep, without doubt, will be thoroughly clean.

The reason for this treatment is, that it takes from nine to eleven days from the deposition of the egg to the hatching of the insect. The first dipping destroys all disease actually above the skin; but the embryo insects, protected from the tobacco, would escape. These, previous to the second dipping, have all appeared, and are then killed. The third is solely reserved for some stray insect that may have escaped. This last application is probably almost unnecessary, but, after previous trouble and expense, it is well to err on the right side and make all safe. Of course it is necessary to be very careful that no sheep be left behind, so as eventually to reinfect the flock. Although a considerable outlay is necessary for all this, it will prove to be money well invested. Many sheep farmers, after a course of years, spend in handwashing and other *economical* plans this amount several times over, and find the enemy still unconquered.

Probably the only sure protection against scab is the fencing of the sheep farm, and the suitable subdivision of it into smaller allotments. The sheep-growers are generally becoming aware of this, and many of them are laying out large sums of money on iron fencing.

Toward the extreme south, which has a moister soil and climate, the diseases of catarrh and foot-rot are known but to a very limited extent. Scab, indeed, may be said to be the only disease peculiar to sheep in New Zealand.

At present a great proportion of the runs are only nominally stocked. Many would carry seven and eight times the number of sheep that are at present on them. And it must be further recollected that the presence of sheep so enriches and improves the land, that a plot of ground now supporting one hundred the year round, would probably, ten years hence, be sufficient for thrice that number.

New Zealand is, I believe, the only country in the world where there is no fixed lambing season. On account of the mildness of the climate this is not of such serious importance as it would be elsewhere. Still, no doubt, it is detrimental to the breed, and in a few years this carelessness will perhaps be remedied.

The average annual increase in the ewes may be reckoned at eighty per cent., all of which, when scab does not interfere to increase expenses, may be considered as clear profit—the wool amply paying all charges for the management of the run.

From the above it may be calculated that the export of wool, which is already of considerable extent, in a few years' time will become of greater importance.

Some sheep-breeders have lately been importing Saxony rams; these, crossed with the Merino blood, are serviceable by causing a closeness in the wool, thereby materially increasing the yield.

There are, and will be for years to come, in each province excellent markets for the sale of the carcases; wethers in good condition at present fetch from 8 dols. 50 c. to 9 dols. 50 c. per head. The price cannot fall below a certain point, as a fortnight's sail would secure a fine market in Melbourne or other Australian ports, while along the coast are plenty of small harbours suitable for the colonial trading vessels.

In conclusion, I may remark that the sheep farmers as a class are a most pleasant, hospitable body of men, and at the present time, as a rule, are rapidly making money.

CANTERBURY, *New Zealand*, 1859.

WELSH FARMERS AND FARMING.

At the Abergavenny Society's Meeting,

Mr. O. MORGAN, M.P., said it had given him great pleasure to be there that day, and he had been much gratified with the spectacle in the show field: the show had been a great credit to the town and neighbourhood, both as regarded the stock and implements. Small local shows were of great benefit to the country. He recollected the state of agriculture in this county from early youth, more especially in his neighbourhood, the vicinity of Newport, and he had seen the vast improvements which had taken place year after year ever since the establishment of a show at Newport, by his father, in 1816. He attributed the great improvement entirely to that exhibition. These agricultural meetings and exhibitions were no new things or new ideas: that started in 1816 had gone on continually increasing until the small buildings originally erected for it became too confined, and now there was a much larger yard used for the purpose, there was almost a difficulty in finding accommodation. Everybody knew the small and humble beginning of that show, but in these small societies he saw the germs of much larger institutions, which would eventually develop themselves. Whether they would remain in the position of local societies, or unite and form one large institution, was a question for the future; but he had no doubt, from his own personal and practical experience, that these small shows would improve more than anything else the farmer, the quality of his stock, and everything connected with agriculture in their immediate localities. A large show like that at Newport would not so much have that effect; emulation and rivalry must be excited between individuals in the immediate vicinity and neighbourhood of one another; thus they would improve, until at last they would find it worth their while to send to a distance, and compete with others. The persons who now exhibited at Newport came from all parts of the country, just as they did to the great exhibition of the Royal Agricultural Society. It would be absurd for the small farmers in this district to send there, but they were in the same position here as the great breeders were at the great shows; and as they improved, so would they be enabled to send to the larger socities with the probable expectation of gaining prizes. He therefore looked upon these institutions as of great importance to the country, which must be immensely improved by them. He therefore hoped to see them all flourish. He was glad to see premiums offered for good ploughing, without which they could not have good farming. He did not approve of the objections which had been made in certain newspapers to the premiums given to labourers, which were said to be degrading. He thought it was a good thing to acknowledge the services of a good labourer, and to encourage men to be good labourers. Without good labourers they could not have good farming. The farmer was indebted to the labourer and the labourer to the farmer; there was a reciprocity between them, which ought to be acknowledged. It was not the dirty pound they gave a man; it was the fact of his worthiness and good qualities being publicly recognized, which made him feel that he had done right; and if a man did right, he should be encouraged in it. The small cross or the medal on the breasts of our soldiers was not the object; it was the honour and dignity of station they acquired by their brave and valorous deeds. Their great reward was the self-esteem they felt, and the estimation in which they were held by their fellow men in consequence of what they had done. It was this which made a man feel proud and noble in the feelings which animated his heart, and made him proud of the position he occupied. In every sphere of life, he who did well should have his goodness acknowledged, as an inducement to others to emulate him, and place themselves in a position of similar merit.

Col. CLIFFORD, M.P., said: There was at that moment, as there had been for many years past, a great desire to draw out the capabilities of the soil to the utmost of its power and resources. In the parish to which he belonged—one of the most isolated and rural—there was a great improvement visible, and they had even ventured to send forth a champion to contend for the prize for the best cultivated farm. They were still in ignorance as to who was the winner, but they did not give up the hope of carrying off the prize. But they had in Llantilio a habit of growing a crop which, though very productive, was not very profitable; and if any spirited agriculturist would give them a lift, and propose a prize for that particular crop, it might have a beneficial effect; he alluded to the growth of thistles. If any gentleman would next year give a prize for the best crop of thistles, there should be such a list of competitors as never had been for any other prize, and the winner would be found, he believed, in the parish of Llantilio. He had not been a very successful competitor to-day, but he was by no means certain that he might not win that prize. That sort of crop showed the rich productiveness of the soil, but did not bring money into their pockets, and he wished they could get rid of that very prolific and troublesome crop. It was no use for the gentleman on one side of the fence to work his land well, if the gentleman on the other side of the fence allowed his thistles to grow unrestrained. Barring that one drawback, he believed they had got their land as clean and productive as most parts of England in ordinary cultivation.

J. A. HERBERT, Esq., the Chairman, said: They could not fail to notice the rapid advancement made in agricultural pursuits of late years, but they must also feel that vast strides yet remained to be taken before agriculture could attain that position in which they all must wish to see it. It was satisfactory to look back upon past progress, but it was perhaps more practically useful to look forward, and see in what way they might advance in the future. Without attempting to deliver anything like advice upon farming matters, he might offer his opinion that it was highly probable that this neighbourhood would never attain very high prominence as a corn-producing district, but that they might vastly improve their stock. There was no reason why, at some distant time, their stock should not be able to compete with the far-famed herds of the adjoining county (Hereford). Their soil produced green crops and pastures which were not very easily surpassed, when carefully attended to; but their great deficiency lay in the state of farming accommodation and farm buildings generally (cheers). He knew what they meant by those cheers: he fully expected to be told that this was a landlord's question. He admitted that it was the duty of every landlord to second and encourage the endeavours of any tenant who might endeavour to better his position; he admitted that responsibility, and he believed most landlords were prepared to join him in this, if they were met by their tenants in a liberal spirit, and if they saw their way to something like a fair remuneration for their money. They were often asked to put up fine buildings which were not remunerative; but on the whole, a very good feeling prevailed between landlord and tenant in this district. This was amply shown by the long duration of tenancies in the neighbourhood, very many of which extended over two or three generations. He trusted that good feeling would long continue, and he wished, if it were possible, to draw a still closer bond of sympathy around landlords and tenants; for though each might be perfectly and entirely independent of the other, yet they should feel a mutual interest in promoting the fertility of the soil, and in order to do so they should co-operate in a cordial and liberal spirit.

The CHAIRMAN gave "Prosperity to other Agricultural Societies," coupling with the toast the name of Mr. Relph, as the representative of the Usk Society.

Mr. G. R. G. RELPH responded to the toast in a humourous and congenial strain, drawing a comparison between the little farmers' club at Usk and this august assemblage. But they at Usk were not so small as their name indicated Mr. Morgan had said that great societies were not so desirable, that they must put farmers in leading-string before they could compete with a good grace at the large shows. He subscribed to all that; but he found that all the great guns at Abergavenny had their first lessons in the little society at Usk. George Pritchard, and Warren Evans, and several others, were indoctrinated at the Usk Farmers' Club; they had reaped laurels at Newport, and now here, and no doubt would go from Abergavenny to the next great agricultural show—that of the Royal Society. He differed altogether from Mr. Morgan in one part of his remarks: he did not like rewarding labourers for getting a good number of children, and then keeping them off the parish. He did not like giving them rewards on occasions like this; he liked to reward them in his own service. If they showed that they selected good labourers, they would get good ones; but as long as farmers would take any man who came with a hook on his back, without asking him where he had been serving or whether he had a character, they would never have a good class of labourers. That was too much the case: if a man was discharged from the adjoining farm, they did not inquire the reason why he was dismissed, but engaged him at once, without putting themselves to the inconvenience of doing what would raise the standard of character among the men. Until they made some little sacrifice, they would never improve the character of their men as they would like to see it improved. They cultivated ploughing by giving prizes, and they had a very good class of ploughmen in that neighbourhood; but they might hold out prizes to their labourers which would make them generally active. If they had a man who was good at jumping, and running, and wrestling, he would be the more useful in his work. Athletic sports should be more supported and provided in Monmouthshire, so that the men could engage in these exercises instead of soaking and sotting in public-houses, and smoking pipes. If they could introduce such prizes it would be a good thing, and they might give prizes to labourers for the best running and the best jumping, high jumping and long jumping. It would improve the standard of the labourers, and instead of lopping along at the rate of a mile and a half an hour, they would go on as Lord Hardwicke said he liked to see men going, "with their elbows before them." He agreed with what Mr. Herbert said about the duties of farmers and tenants. Not one-half the farmers in the county were worth putting up good buildings for. He was speaking the truth, and therefore was not ashamed of it. The only way to bring about the mutual feeling of interest between landlord and tenant, which was so desirable, was for the landlords to pick out good tenants, and the tenants to pick out good landlords. To the tenant-farmers he would say, "Don't take the land unless you get good leases." Then, and only then, they would attain to that mutual interest which Mr. Herbert had so well depicted; then they might begin to grow and flourish; but as long as men felt that they might be turned out any year, this happy state of things could not be brought about. They were not all of old county families like Mr. Morgan and Mr. Herbert: they were a money-making set of men now-a-days; but when they saw a man cultivate his farm well, and get a prize here, and then another at the Tredegar show, the landlord noticed the improvement, and stepped in with a demand for a little more rent. There was always some one ready to step in at once, if the tenant objected to this course. This would not be the case if leases were granted. He was glad to see an advertisement in the county papers a few weeks ago, in which a very good farm belonging to the Duke of Beaufort was announced to be let by tender. This had created an unpleasant feeling among some of the farmers, for the fashion had been to run to the parson or squire of the parish and get a character, such as anybody could get. Then they went to the steward, or agent, or to the landlord himself, and talked themselves into the farms, and they could not be refused, because they had such good friends here and there, who had taken upon themselves to recommend men as tip-top tenants, without knowing anything of their capabilities of farming at the same time. If the farms were let by tender, the best farmers would have the opportunity of going before the landlord. Kissing would not then go by favour, and the man of most merit would get the farm. The landlord would be benefitted by this plan, because, from the number of those who applied, he could select the best; he would not be bound to accept the highest offer, but could accept the best man. This was the fashion in his county (Westmoreland), and it was found to answer well. He was glad to see Mr. Wyatt introducing the system in this part of the country.

ON THE PRODUCTION OF THE SEXES AMONG SHEEP.

[TRANSLATED FROM THE FRENCH OF THE "JOURNAL D'AGRICULTURE PRATIQUE."]

The interesting researches of Giron de Bazareingues into generation, and particularly on the production of the sexes amongst domestic animals, are now known but by very few persons, having the misfortune to be of too remote a date. On the other hand, meeting with a very varied reception on their appearance, they have had the fate of all contested things—they have left in the mind nothing but ideas undecided as to their value. Zootechny, in fact, was too little advanced at that period, for the art of animal-production to think of extracting from such a study facts for its use.

Daily observations, conducted and arranged with the calculation in hand, in a sheepfold of great importance —that of the Dishley-Mauchamp merinos of M. J. M. Viallet, at Blanc, in the commune of Gailhac-Toulza (Haute-Garonne)—have enabled me to comprehend the laws which, according to M. Giron de Bazareingues, preside over the production of the sexes. If I am not deceived, I have gained some new hints; but, however this may be, the reader will see in the following notes only an exposition of facts, designed simply to draw attention once more to this curious question. And, as the establishment of any natural law whatever has at all times its utility even in practice, it is perhaps desirable still to find it of importance in the economic management of animals in certain positions.

The general law which Giron de Bazareingues has recognized on the subject of the procreation of the sexes is as follows: The sex of the product would depend on the greater or less relative vigour of the individuals coupled. In many experiments purposely made, he has obtained from the ewes more males than females, by coupling very strong rams with ewes either too young or too aged, or badly fed; and more females than males, by an inverse action in the choice of the ewes and rams he put together.

This law has developed itself regularly enough at the sheepfold of Blanc, in all cases in which circumstances of different vigour between the rams and ewes have been observed in coupling them. Witness two striking examples of it:

In 1853, births, the issue of young ewes by a Dishley-Mauchamp merino ram, extremely vigorous and highly fed, produced 25 males, and 9 females only, or 71.73 per cent. of males, and 28.27 per cent. of females.

At a later period, the same ram, still in full vigour, having been put to some ewes that had done nursing their lambs—a period at which the ewe is found very weak—there resulted, in 1853, 8 male births against 4 females; and in 1854, under similar circumstances, 17 male against 9 female births. The two occasions united yielded 65.78 per cent. of males, and 34.22 per cent. of females.

But the following fact has nothing in common with those related by Giron de Bazareingues, and which has been repeated, with small variation, every year, from 1853—the period at which the observations I have noted down began.

This fact consists:

1st, In that, at the commencement of the rutting season, when the ram is in his full vigour, he procreated more males than females.

2nd, When, some days after, the ewes coming in heat and in great numbers at once, the ram was weakened by a more frequent renewal of the exertion, the procreation of females took the lead.

3rd, The period of excessive exertion having passed, and the number of ewes in heat being diminished, the ram also found less weakened, the procreation of males in majority again commenced.

In order to show that the cause of such a result is isolated from all other influences, of a nature to be confounded with it, I shall take the year 1855-6, in which, by the effect of a degree of equilibrium of age and vigour between the rams and ewes, the male and female births were found, relatively with each other, nearly upon a par in numbers, being 25 males to 23 females.

The following table, drawn up with the dates of birth, exhibits the facts in detail. The letter M. indicates the male, and F. the female births.

It will be seen that, the list of births having been divided into three successive series, and in mean proportions almost equal, we have for the first, of eleven days, from the 27th December to the 8th January, 13 males against 4 females; for the second, of nine days, from the 9th to the 18th January, 3 males only against 15 females; and for the third, of eleven days, from 19th to 29th January inclusive, 9 males against 4 females.

TABLE OF THE DISHLEY-MAUCHAMP MERINO LAMBING, AT THE SHEEPFOLD OF BLANC, IN DECEMBER AND JANUARY, 1855-56.

First Series.

Date	Sex
Dec. 27	M.
30	M.
31	M.
Jan. 3	M.
3	F.
3	F.
Jan. 4	M.
4	M.
4	M.
5	M.
5	M.
6	M.
Jan. 6	M.
7	F.
8	M.
8	M.
8	F.

Males, 76.8 per cent.; females, 23.9 per cent.

Second Series.

Date	Sex
Jan. 9	F.
9	F.
11	M.
12	F.
12	F.
13	F.
Jan. 13	F.
15	F.
15	F.
15	M.
16	F.
16	F.
Jan. 16	F.
16	F.
16	F.
17	F.
18	M.
18	F.

Males, 16.66 per cent.; females, 83.34 per cent.

Third Series.

Date	Sex
Jan. 19	M.
19	M.
19	F.
19	F.
20	M.
Jan. 20	M.
20	F.
22	F.
22	M.
23	M.
Jan. 24	M.
24	M.
29	M.

Males, 69.23 per cent.; females, 30.77 per cent.

At the end of each month, all the animals of the Blanc sheepfold are weighed separately; and, thanks to these monthly weighings, we have drawn up several tables, from which are seen the diminution or increase in weight of the different animals, classed in various points of view, whether according to age, sex, or the object for which they were intended.

Two of these tables have been appropriated to bearing ewes—one to those which have borne and nursed males, and the other to those that have borne and brought up females. The abstract results of these two tables have furnished two remarkable facts.

1st, The ewes that have produced the female lambs are, on an average, of a weight superior to those that produced the males; and they evidently lose more in weight than these last, during the suckling period.

2nd, The ewes that produce males weigh less, and do not lose, in nursing, so much as the others.

If the indications given by these facts come to be confirmed by experiments sufficiently repeated, two new laws will be placed by the side of that which Giron de Bazareingues has determined by his observations and experiments.

On the one hand, as, at liberty or in the savage state, it is a general rule that the predominance in acts of generation belongs to the strongest males, to the exclusion of the weak, and as such a predominance is favourable to the procreation of the male sex, it would follow that the number of males would tend to surpass incessantly that of the females, amongst whom no want of energy or power would turn aside from generation; and the species would find in it a fatal obstacle to its reproduction. But, on the other hand, if it was true that the strongest females, and the best nurses amongst them, produce females rather than males, Nature would thus oppose a contrary law, which would establish the equilibrium, and, by an admirable harmony, would secure the perfection and preservation of the species, by confiding the reproduction of either sex to the most perfect type of each respectively.

MARTEGOUTE,
Former Professor of Rural Economy.

AGRICULTURAL AND CHEMICAL COLLEGE, KENNINGTON.

LECTURES ON PLANTS

Applied to Useful Purposes throughout the World, or otherwise fulfilling obvious offices in the Economy of Nature, commencing with those which are the Principal Objects of Cultivation, as furnishing Food, Fibre for Manufacture, Medicine, Colouring, Astringent and other Properties applicable to the Arts.

BY CHARLES JOHNSON, PROFESSOR OF BOTANY AT GUY'S HOSPITAL.

LECTURE III.

From what has been already observed in illustration of the differential characters separating our five groups, the grasses termed *colonizers* are evidently plants of no trifling importance, so far even as our own economy is concerned, although neither furnishing food to animals, especially to those in which we are the most interested, nor, considered in the aggregate, adapted to any immediate purposes of utility. The rigidity of texture and almost woody hardness, by which they are generally characterized, is chiefly due to the presence of siliceous matter, in comparatively large proportion, in their stems and leaves, and, added to the small quantity of moisture contained in their several tissues, and the absence of sugar, renders them unpalatable to cattle; thus constituting their principal safeguard, and leaving their growth to the uninterrupted fulfilment of the purposes for which they were created. Those purposes are not in all instances confined in their action and influences to the spots on which the grasses themselves vegetate, but are frequently extended to indefinite distances, involving results of acknowledged value, but unknown, and therefore unappreciable derivation. This fact is evinced by tracing the history of many plants of the tribe belonging naturally to high alpine regions, not vegetating upon the flats and slopes, where soil may rest and accumulate in depth from year to year undisturbed, but rooting in the clefts of the sharply precipitous or, even, perpendicular rock. Here, long before the little grass-seed lighted upon its rugged, bare, or lichen-covered face, alternately were lodged the slanting rain-drop and the drifting snow-flake, while the frosts of many winters have shivered and loosened the texture of the stony mass. The slender, perennial, persevering roots of our grass penetrate slowly every little crevice, and, as they enlarge, loosen still farther the fragments that, eventually, falling or washed down by the torrent or the pelting storm, are destined to renovate and raise the soil of the valley or the plain below. The fertility of these is founded and maintained by this periodical, but often unobserved, supply; but the action, the office of the alpine colonizing grass is not a merely mechanical, a simply disintegrating process exercised upon the medium on which it grows; the loosened and ground-up rock may form and deepen soil, but its fertilization must come from a different source; the decaying tissue of the grass itself mingles and falls with it—the soil carries down the manure—the poverty of the mountain-top feeds the richness of the valley.

Numerous other plants, higher in structural grade, but equally excluded from participation in the lengthened career of usefulness distinguishing their fellows, aid in the furtherance of the grand design, our grasses constituting only a moiety, or rather a mere item in the roll-list of Nature's brigade of pioneers; they are, nevertheless, among its more conspicuous and effective leaders.

These rock-dwellers are more than mere leaders, more than simple volunteers to the van of vegetable progress; they are princes in their wild and breezy *habitats*; princes as firm and defiant, as absolute and tenacious of authority and dominion, each in his own little nook of hermit-solitude and circumscription, as were whilom the castle-robbers of the Rhine, caged, but glorying in their inaccessible fortresses. Once established in perennial state, they seem to scorn alike the furious rushing of the mountain torrent and every element of the raging tempest, exerted to dislodge them from the chosen site. Years may roll onward in the course of time, and the destinies of nations may be overruled or changed; but the tuft of alpine grass still waves to every passing wind, and holds its own above them.

It is the depth to which their meandering roots extend, and the intricate development of slender rootlets, grasping and filling every little crevice below the mouldering surface, though all but invisible to human eye, that enables the sturdy colonists to maintain the position they have appropriated. No ordinary, no timid hold is theirs. Does a hostile force strain one petty fibre, and strive to loosen or impair its cling, a thousand counteracting powers are at hand for its support; lever and wedge, each modification of mechanical agency yet unnamed and unappreciated, is instantly at work to check and triumph.

The distribution of such grasses, apparently a mere fortuitous circumstance, the lodgment by chance of an inconspicuous seed wafted by the wind against a mountain side or peak, is a dispensation no less deserving attention than the result which follows: setting aside the secret agencies by which that seed was produced and endowed with the attribute of growth, what complicated powers have been invoked to bring it hither! hither, where only its capabilities could have been availably called into action, and rendered subservient to the solitary seeming purpose of their creation. But all this has been provided for by the adaptation of the seed itself—its distribution when cast abroad, its security and fixity when deposited, its unerring growth or germination, and ultimate efficiency to the task ordained. We will look at one of these Alpine grasses, a distinguished member of its hardy family, almost alone in beauty, but no less a striking exemplification of the general law, under which, by varied but ever competent provision of means, the dispersion and multiplication of plants is effected.

The illustration selected is the Feather-grass, *Stipa pennata* of botanists. The dense tufts of stiff, erect, needle-like leaves mark the character of its birth-place and position in the scale of vegetation. The high mountain ranges of central and southern Europe brought it forth, and its natural home is among their loftier and most precipitous peaks. Needle-like are its slender glaucous leaves; nay, more resembling hairs in fineness. With the exception of this latter feature, so exaggerated even when compared with the narrowest foliage of most others of the class of mountain colonists, there is not anything extraordinary in its general appearance at the first glance, not anything to challenge our attention or dispose us to farther examination. The flowers are even less conspicuous than those of grasses generally. It is in the ripened fruit or seed, so termed, alone, that we trace the all but matchless elegance and beauty of structure, adaptation, and design which demand our highest admiration.

The paleæ, or inner scales of the flower, closely invest and harden round the seed-like fruit, which thus terminates above in a long thread-like awn, often nearly a foot in length. The upper and longer portion of this awn is beautifully fringed on opposite sides with short, very delicate, silky plumes, whence the English name of "Feather-grass." Frequently cultivated in our gardens on account of this peculiarity, while bunches of its ornamental feathered seeds have their place among the many graceful decorations of modern dwelling-houses, description would be scarcely required, were not the admirable mechanism involved in these appendages more remarkable than their singularity and decorative character. Their buoyancy favours the wide distribution of the seed by the action of the wind, at the same time that their structure determines its adhesion to the spot whereon it may alight. To effect the latter, the feathered or fringed portion of the awn is bent at an angle of 45 degrees, and capable of being acted upon in the manner of a vane when the wind is blowing; while the base of the fruit or seed which it terminates is sharply pointed, so as to ensure its hold in a perpendicular position, wherever the point penetrates. Thus situated, every varying breath of wind communicates a more or less rotatory movement to the plume, and the necessary deep insertion of the seed is provided for by a long screw-like twist of the naked part of the awn rising straight above it below the bend, the volutions of which, as they become successively buried, prevent its return to the surface. It is, in fact, thus screwed down into the light soil or sand filling a crevice, or occupying a hollow in the rock, in which it soon begins to vegetate.

It is not every Alpine or rock grass that exhibits so strikingly its adaptation to the circumstances of its existence; but in all cases examination will lead to the recognition of some beauty of design, and fitness to the position destined to be occupied. To trace the diversity of means through which such purposes as those above described are individually effected is unnecessary, and would lengthen our details greatly. In no two species do they correspond; and, as among animals, the function of breathing and its results may be fulfilled through the medium of lungs, or gills, or pores; so, among the colonizing grasses, the distribution and planting of the seeds are events secured by very different, but equally efficient contrivances.

The rock-grasses, in their high mountain *habitats*, are perhaps less strictly colonists than their brethren of the sandy wastes below. They furnish soil, but not to their own localities: no effect of their growth is manifest upon the rock that bears them. Their duty is a constant and essential one elsewhere; but no change, save that of stone-disintegration, takes place on the surrounding stony surface. As at first its little time-worn clefts and hollows yielded place to the wandering seed, so do they still; but nothing more. No accumulation of organic matter courts vegetation of a higher grade to settle on its bleak exposure: the jutting pinnacle and the overhanging or perpendicular precipice remain as bare and unswathed by mantling verdure as ever. But the level table-land and the sandy sea-side plain afford a resting-place for all that Nature sends there. These are the resorts of the true plant-colonists; these are the sites where soil may accumulate from year to year, until at length the fertile and well-stocked pasture may succeed the desolate and solitary wilderness. These are their true homes in multitude; and the rigid, flavourless, and dusky foliage covers all the ground. What different economy here regulates the panorama of vegetable existence and increase! The chance, wind-wafted seed may serve to propagate the lonely perennial tenant of the rift; but such distribution would do little towards fulfilling the more extended purposes circumstances now require. The grasses here most useful are chiefly annual—in habit, perhaps, compact and tufted, but evanescent and renewing. Most annual plants are prolific, free to flower and mature seed alternately; and when the latter is scattered, the parent dies. Roots, clustering foliage, and flower-stems decay in mass, to feed and foster a succeeding generation, destined in its turn to fade, and be supplanted by its offspring.

The number of seeds produced by one of these annual grasses has not been recorded—possibly they have never been counted; but we find them vegetating so abundantly in their several localities, as to confirm the general fact of its vastness. But no mere passing glance of this kind can enable us to form any correct idea of the all-but-limitless powers of propagation belonging to many species of plants, and especially to those whose individual duration is confined to a single season. A few instances from annuals belonging to families of far higher grade than that before us, though they will not decide the question as to the multiplication of our grasses, will at least indicate the wideness of the range to which it may possibly extend. A single stalk of the common tobacco furnished upwards of *three hundred and sixty thousand seeds.* This fact was ascertained by weighing the whole produce, which amounted to *three hundred and sixty grains* troy, *one thousand and twelve* seeds weighing only a single grain. A single thistle developes more than *twenty-four thousand* seeds. The square of these numbers would, of course, give the produce of the second crop, supposing all of the seeds produced to vegetate; and the result is startling to those unaccustomed to observations and facts of the kind. In the thistle, it amounts to 576 millions; in the tobacco, we require twelve figures to express it—129,600,000,000, or 129,600 millions. The Roman poet of husbandry informs us that the thistle is a dreadful nuisance in corn-fields; and the English farmer would profit by reading a lesson from the "Georgics," remembering at the same time the numbers here given, and that, prolific as the thistle may be, there are other *weeds* equal to it in productiveness, or even more so, although the tobacco, with its twelve figures of numeration, is wanting.

Regarding the number of flower-stems thrown up during their short season of growth by many of our little sand-grasses, and taking into account the circumstance that the same summer often witnesses the maturity of two or even three successive generations, although our statistics of propagation in their case are not yet forthcoming, we need not hesitate to admit them into comparison with the foregoing. The poorer the land, the more they abound and multiply; and when the soil becomes enriched, either by art or by their own decay, they abandon it, or rather, cease to flourish, and disappear, being overpowered by the more vigorous and perennial growth of new arrivals.

It is unnecessary here to enumerate the individual workers. They are many; and one succeeds another. Species less and less rigid gradually become associated with the earlier and meagre settlers; then perennial ones, with broader and brighter-green foliage; then the wild animals and the sheep begin to feed upon the mingled vegetation. Many of the secondary colonizers are thus regarded as pasture-grasses. Such are some of the fescues, which improve in foodful quality with improvement in the condition of the soil. The gradations of grass-value, in this respect, are so finely traced, that it is difficult to draw the line of demarcation between the simple innutritious colonizer and his half-endowed successor, which the hungry pasture-feeder hesitates whether to bite or leave untouched.

When these perennial grasses grow in very elevated and exposed situations, their flower-stems, instead of developing flowers, bear small leafy buds, forming masses that might at first sight be mistaken for inflorescence: these buds, eventually dropping off or being carried away by the wind, root where they fall, and rapidly mature into young plants. In such instances, the parts which should compose the floral organs, as the chaffy scales, stamens, and pistil, are present rudimentally, but, in lieu of assuming their several characters, become miniature leaves. There is not anything mysterious in this, as you will find remarked in my introduction to "The Grasses of Great Britain." Every flower is, strictly considered, a condensed branch or stem, and each of its parts or organs a modified leaf, and, as such, liable to develope as a common leaf when unrestricted by the peculiar conditions which compel it to assume a different form. Garden-cultivation affords numerous instances of this liability to floral metamorphosis, every double flower that decorates the parterre being an illustration of the passage of one set of organs into another. Our double roses are frequently disfigured, in the estimation of the florist, by presenting a green, leafy centre, the result of an imperfect modification of the leaves that, in the natural state of the flower, would compose its pistils. I have succeeded in raising a rose-bush by planting such a production, which was, indeed, only planting the terminal bud of a branch. The multiplication of a grass by its modified flower-buds is, therefore, a parallel process in organic development.

It is, then, only the capability of our colonizer to adapt itself to circumstances that is deserving of remark; and we might search in vain for any instance of the kind among the vegetation of the lowland meadow. It is only on the dry and elevated rocky pasture, and on the high table-land and the mountain-side, swept by bleak winds that tend to derange and interrupt the functions necessary to the production of seed, or rather, perhaps, where the short duration of the summer heat is insufficient for ripening the latter, and afterwards maturing the young plants to a size and strength sufficient to enable them to withstand the long winter cold, that grasses assume this curious and interesting habit, under which they are said to be *viviparous*—a term denoting the production of living offspring.

The viviparous habit does not belong exclusively to grasses, nor, among them, to the colonizing species only; but it is one that materially assists in their propagation, as well as in that of their immediate successors. The grand object attained by it appears to be a saving of time, as the seedling plants of perennial grasses rarely flower until the second year; while these living offsets are productive about the same period as the individuals from which they were scattered.

THE STEAM-PLOUGH—AND ITS PROGRESS.

How often do we stand battling over comparative trifles, while some matter of far greater import almost altogether escapes us! We obstinately refuse to heed the suggestion of the A. 1. Division, and "move on," although we may miss all the best of the business by stopping where we are. We are still running heel in cover, with a good fox viewed away, and despite the admonitory *crack* and "get on to him, there!" of an anxious whipper-in. He is clean gone by this, and really if some of us do not make the best use of a start, we may be never able to hold our own again. You may see him steaming away four or five big fields ahead, and it will never do to keep pottering here amongst the plough teams. It was but a slight check after all, and Will Smith has hit it off again, with a scream, and away we go, travelling over the large inclosures at a better pace than ever. John Fowler, too, is once more to the fore, and crossing the country like a workman as he is. With such pioneers as these, it will be our own faults surely if we do not see something of it. *Eu!* forward! then—and the jolly yeoman carefully scanning the line he has taken, settles himself firmly to it, and means to go a good one.

Is it not so? Have we not for the last few months been more busy than ever, over Howard, Hornsby, and Ransome? Have we not been continually trying back, and pitting the wheel plough against the swing, and then keenly matching one wheel against the other! And all this time there has been the steam-engine stealing away from us, with a few knowing hands making the most of a good start, but all the rest of the field on the wrong side of the wood. Some, however, are now fairly catching them, while one or two of our pilots have not been quite so intent on the rings we have been running in cover as might have been imagined. Judiciously enough, they have each a second horse out. It is very noticeable that, energetic as the Messrs. Ransomes and Howards have been in maintaining or improving the character of their several ploughs, either has been as actively and as directly engaged in developing the principle of ploughing by steam. To change our metaphor from the chase to the turf, Woolston is brought to the post by the Howards, and The Young Fowler by the Ransomes.

Never, however, has such decided or reliable progress been made as during the past autumn. Ploughing by steam is now nothing less than an established fact. It has been stated that thirty thousand acres of stubble have been broken up in this way since harvest, but we are inclined to put this as much below the mark. Statistics we have none, but evidence of a very high order is before us, from which we gather not only the extended use of such a means, but the effectual manner in which obstacles and objections have been overcome. Mr. Fowler and Mr. Howard have just published, almost simultaneously, each a number, or rather a collection of testimonials from practical agriculturists, speaking in the most satisfactory terms to the way in which the two systems have recently been found to work.

It is an old but too true an adage that a man rarely reaps much honour amongst his own neighbours. Mr. Smith of Woolston is an instance to the contrary. His brother farmers and friends about him have been the first to take him up, and the firmest to stand by him. The pamphlet just issued opens with five testimonials in his favour from farmers in Bedfordshire, and twelve from others in Buckinghamshire, all of whom have of course sets of his apparatus. Mr. Pike says very pertinently to this point:—"In adding up the work I have done with the steam cultivator, I find it upwards of 1000 acres. I am proud to see my neighbours following my example: there is now another set in this small parish, and in riding from Bedford to my home, a distance of five miles, four steam cultivators may be seen at work besides my own." Mr. Robinson continues: "My neighbour, Mr. Pike, having worked Smith's Steam Cultivator with great success for two seasons, I was induced this autumn to purchase an engine and a set of apparatus for myself. As my farm adjoins that of Mr. Pike, I have had full opportunity of judging of the merits of the steam cultivator, and should not certainly have made such an outlay had I not been fully convinced that it is the right system for working the heavy clay soils of this country." Then, in Buckinghamshire, Mr. Bignell gives—"One excellent proof of the estimation in which Smith's Steam Cultivator is held in this small parish of 1500 acres—three tenant farmers have purchased a set each. This parish adjoins that of Woolston, where Mr. Smith originated and carried out his system." Mr. Whiting narrates how "Being only a few miles from Mr. Smith, I endeavoured to hire his apparatus; and although he refused to work for hire, he was good enough to lend it to me in September, 1857, as well as in the following April. Its work soon convinced me of the superiority of steam over horses for the hard work of the farm, more especially in the autumn, and that once over with Mr. Smith's Cultivator on a bean stubble is worth more at this season than two ordinary ploughings. I therefore determined to have a set of my own." Mr. H. S. Trower "having farmed land adjoining for some years, I have had every opportunity of judging of the merits of Smith's system of steam cultivation: after full deliberation, and constantly watching the operations, I was this autumn induced to purchase a steam-cultivating apparatus for my own use." And Mr. Revis "was the first in this district (Olney) who gave an order for one of Smith's steam-cultivators. I have worked it on my own and tenants' farms to great advantage for three years, and consider it an indispensable implement where 400 or 500 acres of land are cultivated."

We consider this testimony of the very highest order. Had there been any flaw, neighbours would have been the first to speak of it; and had the principle been at all defective, so assuredly would they have been the last to adopt it. There are similar reports from the counties of Gloucester, Huntingdon, Leicester, Lincoln, Northampton, Oxford, Stafford, Sussex, Worcester, York, Cork, and the Isle of Wight, where the Prince Consort has a set in use. Mr. Surman has "now nine cart-horses in place of thirty-two"; Messrs. Armstrong and Topham "twelve less than usual"; Mr. Sowerby has "reduced the number considerably"; Lord Hatherton his teams "to nearly one-half"; Mr. Stevenson "from eleven to seven," although he does "not think the principal saving is in horse-flesh"; and so on. It would be impossible here to touch on the advantages of such a system of cultivation, the saving in expense, the convenience in use, and other collateral recommendations—all of which are as strongly spoken to, and that we may dwell on hereafter.

Let us now hasten, to do some similar justice to Mr. Fowler and his, in contradistinction, "plough proper." In doing so, let us lead off with a gentleman whose name at this season will be tolerably familiar to most of us. Mr. Stratton is by no means a man of one idea. All his hopes at Hinton do not quite centre on the shorthorns and the next gold medal. Hear how he has cut through one of the great difficulties of cultivation by steam:—"*We put our own farm-servants in charge of it, and for the last three weeks they have been quite independent of any other assistance.* It has had a great number of spectators, and just as many admirers; all who see it, speak of it as a great success. When ploughing for wheat it did from 6 to nearly 8 acres per diem. I believe that in the summer it will plough from 7 to 10 acres. I think it much cheaper than horse-ploughing, as it will do more work than 24 horses; but the great advantage from it is that the work is done better and in more seasonable time." Then Mr. Savidge, almost equally well known in the shorthorn world as the manager of Mr. Langston's herd, has "had the plough in daily use for the last three weeks *without the slightest accident or breakage*;" and he has "dispensed with seven old horses and ten working bullocks." Mr. Arnot has had "no breakage of the slightest consequence;" and Mr. Saltmarshe reduces his horses "from twenty-five to fifteen." Mr. Pocock has been "free from what I most dreaded—breakage. I have moved the tackle to my other farm and back, a distance of ten miles, without any mishap." Mr. Higgs considers that "Mr. Fowler's system has perfectly settled the question that land can be better and cheaper cultivated by steam than by horse power;" and Mr. King wants "another ten-horse engine by Christmas, as we have so many orders on hand." Then Mr. Holland, a county member and a very eminent agriculturist, made the admirable working of Fowler's steam plough the text-word of his speech at Gloucester the other day. After detailing the striking success of his practice with it this season, the honourable gentleman concludes by stating it as his full belief that "in the long run the farmers of England would be found joining together to use a steam plough, if they could not afford one individually, the same as they now joined together to use a steam thrashing machine; and when a man had once used a steam plough he would no more go back to horse ploughing than he would to the flail for thrashing. Such was his experience." But we give the speech in full, and on behalf of Mr. Fowler we ask the best attention of our readers to this volunteer offering in his favour. Neither must his position on the prize lists of both the English and Scotch Societies be overlooked.

This evidence, it must be borne in mind, comes from all parts of the kingdom. As it is not every one, however, who cares to read advertisements or complimentary testimonials, we have selected a few of the strong points from what we consider two very suggestive publications. They either, we repeat, point to steam cultivation as an established fact. Still a little higher authority might be now useful. Some years since the Royal Agricultural Society of England instituted a general inquiry into the working of Crosskill's clod crusher, and the Highland Society has more recently reported on the reaper. Surely this is the time for the Royal Society to organize a similar commission over the steam plough. There is plenty of evidence still to be taken. There is ample material to work up; while some such incentive is just what is wanting to further a principle that has so far bravely fought its own way.

MR. E. HOLLAND, M.P., ON THE ADVANTAGES OF PLOUGHING BY STEAM.

At a meeting of the Gloucester Agricultural Society at Cirencester on the 24th Dec., this gentleman said:

At the end of the year one would like to review what had been going on in the agricultural world during the year; and they must all be alive to the advances made by steam ploughing within that period. He should like to give them his experiences upon this subject, but was afraid that the figures and details would prove to be too tedious. That glorious fellow Cocker could not have got to heaven yet, although he died so many years ago. He hoped he should not encroach too much upon their patience, but if they got tired of the subject he hoped they would cough him down, and he would attend to the hint. Six or seven years ago he took to one of his farms, which was out of condition, and he felt that some time or other it must come under the steam plough. He commenced by shaping his ground as far as he possibly could, by taking down fences, and running roads straight, paralleled, and at right angles, taking care that his fields should be, as far as possible, rectangular. He wished at once to commence steam ploughing, but there was no machine in existence which reached his wishes. He waited till last year, 1858, when Mr. Fowler succeeded in producing what he wanted—an engine which moved along the field at one end, while at the other end was an anchor, which was moved with and kept opposite the engine. He had waited for an engine at one end of the field and an anchor at the other, to move along the headland, which did not require to be moved by horses. His land was as heavy as land could be, with the exception of a few acres of stone brash. He did not know anything of the working of light soil; and he knew what an injury it was to heavy land to have horses trampling over it. This engine of Mr. Fowler's was what he had waited for, and he wanted to get a twelve-horse engine, but could only procure a ten-horse one. He got some tackle, and took to an old anchor, some old ropes, and the rest of the gear was new. He was speaking now of November of last year. He had met with a few mishaps, as every man must expect to do who commenced with new machinery and a new plan; but still he had ploughed a certain quantity of land. He took a large barley field in one instance, two thirds of which he ploughed by steam, and the other third by horses. He then sowed the field in the usual way, with a Suffolk drill, and last harvest he reaped the whole field with the same reaping machine. It was found that the reaping machine had more work to do on that part of the land that was steam ploughed than on that which was ploughed by horses. They got all the produce in one rick, dividing the steam-ploughed from the other, and it was not yet thrashed; but when he came to thrash it he would be able to ascertain how the different parts of the field yielded. But he did not wish to touch on that, as this was the first year of the trial. He did as Mr. Stratton had done, and was determined to give his engine the most severe trial he could. He therefore tried it upon a stubble field, where the stubble was very thick and very long, and where the furrows were so deep that, when sporting, one had to look over the ridge to see where one's companion was. They ploughed this field across ridge and furrow, and made a good job of it, considering the length of the stubble; of course, stopping from time to time to clear the plough shares, but with that exception they got through the field very well, and considering it was about 14 acres, he thought it a fair trial, and dismissed Mr. Fowler's men, employing only his own labourers. He had found that this steam ploughing had greatly increased their intelligence. They now asked for many comforts which labourers in former years never thought of, and which they looked upon not as luxuries but as necessities. He had now to go into figures, with which he should probably fatigue them. He had ploughed 272 acres with steam, and had ploughed at the rate, sometimes of six, but on an average of four acres a day, and had done 68 days' ploughing. Now came the cost, which he estimated at 24s. for four acres, and which he divided this way. He used upon an average for the four acres half a ton of coal at 12s., that was 6s.; 1s. worth of oil; he reckoned 3s. for a horse and water cart, a boy to look after it 1s.; a man to look after the engine 3s.; and four other men at 2s. 6d. per day, 10s. That made 24s. Now if he had new tackle, with which Mr. Fowler could supply him—and no man was more liberal and pleasant to deal with than Mr. Fowler—he should be able to have two boys instead of two men, which would be a saving of 2s. 3d. an acre. Mr. Fowler estimated the wear and tear at 1s. 6d. an acre; making 30s. for four acres, or 7s. 6d. an acre. If he had done it with horses, he must have had four horses to each plough, and he did not believe they could do more than one acre a day, at 1*l.* an acre. So there was the difference in favour of steam ploughing between 4*l.* and 1*l.* 10s. for the four acres, or a saving of 2*l.* 10s. The next thing to take into consideration was the cost of the whole thing from beginning to end. The machinery cost him 800*l.*, but he had reduced this cost by selling 300*l.* worth of horses, leaving a net outlay of capital 500*l.* Upon this he charged himself 20*l.* per cent., or 100*l.* a-year. For breakages of machinery he charged himself 50*l.* a-year more, placing 150*l.* against the steam-engine. But instead of keeping 20 horses, he had only to keep 12, and the saving in this keep he could not put at less than 30*l.* a-year, which must be taken into account. The 8 horses saved thus, effected a saving of 240*l.* a-year in their keep, to be added to 170*l.*, and taking the 150*l.* a-year for interest and wear, there was a net saving of 260*l.* a year in favour of the steam ploughing. Now he might be right or wrong, but he wished just to place before them what he had done during the last twelve months; and it was for them to consider his statements, and if he was wrong he would be obliged to any gentleman to set him right, and ask him any questions, which he would endeavour to answer. His feeling was that the advantage of steam ploughing was not confined to its greater economy in comparison with the expense of the ordinary plan. But he looked upon it in another light, namely the necessity of deep ploughing. There was one anecdote he would mention, he believed it to be true; it was to be found in Mr. Johnson's work, and the names were given. A gentleman in the north held a farm. He was a capital farmer, but he did not plough deep. For a few years, by dint of using artificial manures, he had fair crops; but at length he found them decreasing and dwindling away. He could not understand this, because he was yearly in the habit of applying artificial manures, phosphates, and so forth, while to such an extent did the crops fail him, that at last he threw up his farm and declared he could do nothing with it. The next year another tenant took the farm at the same rent. He was a deep plougher, and he found out the fault and altered it. He found that the previous tenant had always ploughed to the same depth, till there was a regular hard pan made at the bottom of the furrow, into which the artificial manures sunk, until at last the different crops could find nothing in the ground to feed upon. The new tenant was a bit of a chemist, and his knowledge made him rich. He knew that a good deal of the artificial manure had gone down into this pan. He accordingly ploughed deep, and there was a great change in the farm. Another thing to be taken in consideration in steam ploughing was that it prevented the harm that was done to heavy clay lands by the ploughing of horses over it. Another consideration was this: Chemists told them that every bushel of wheat required 6lbs. of ammonia, which it must have in some shape or other—either in what was formed by preceding crops, or else in guano, or some other manure. But why was this necessary? Because in it was nitrogen, and nitrogen was the only thing that was required for the formation of a good wheat crop. Now, nitric acid was contained in the air, and when it came down in rain, and penetrated into the soil, the constituents of the air and of the soil combined to form nitrogen. So that when these were enabled to penetrate into the ground by means of deep ploughing, a great saving of artificial manures was effected. He believed this question could not be discussed and understood at one meeting, but must be discussed and mentioned over and over again, and that in the long run the farmers of England would be found joining together to use a steam plough, if they could not afford one individually, the same as they now joined together to use a steam thrashing machine; and when a man had once used a steam plough he would no more go back to horse ploughing than he would to the flail for thrashing. Such was his experience, and he hoped he had not intruded too tediously on their time.

THE INSTITUTION OF CIVIL ENGINEERS.—ARTERIAL DRAINAGE.

There are few questions of higher importance and more pressing urgency to this country than the subject recently treated on by Mr. Grantham, C.E., at the Institution of Engineers. We were glad to perceive that it met with the cordial approbation of Mr. Joseph Locke, M.P., the chairman, and all present, for we are well convinced that it will commend itself to our ablest agriculturists. The subject itself is eminently suited for the men who have taken it up. It involves large questions, requiring aid from legislation and from practical science. The history given by Mr. Grantham of what has been done in this country, only helps to bring under our notice what may yet be done. The results obtained from these works also encourage us to proceed in their extensive execution.

But although the greater and more imposing works described in this paper—such as the Eau Brink Cut, the Great Neve Outfall, and others—deserve our attention; yet we conceive that the principal difficulty rests with works of less magnitude—those intermediate stages, if we may so speak, between the grand works of Rennie in the early part of this century, and the individual labours of landowners upon their own property. It is here where the principal hitch is found, and it is to this that Mr. Grantham very properly addresses himself in the greater part of his paper, and that subsequent speakers also turned to.

The subject is so plain, that we should think it almost unnecessary to lay it before our readers. It commends itself at once so readily to the simplest understanding, that we should have conceived all discussion upon it to be so much time wasted, were we not every day made aware of the woful defects now existing in almost all systems of drainage—of the trifling causes which are allowed to stand in the way of improved drainage—and of the obstinacy of interested or ignorant people in wilfully preventing many well-considered and practicable plans from being undertaken. It is easy to perceive how one estate in the back lands may be so situated by position and levels as to be a hindrance to the effective drainage of other estates still higher, unless some large works are carried through the former. Or supposing all the back lands to be well drained, how the low lands may be injured by some one still lower impeding the execution of better outfalls, the very improvements in the back drainage running the water off faster than the imperfect outfalls will take it. Yet both of these operations are everywhere found essential to complete and effective systems of drainage, and at present there is no general act by which such works can be carried out. There is nothing for it but a special act of Parliament for each case, or leaving matters as they are. For as to expect men to be unanimous, even when their own interest dictates the necessity of it, is more than universal experience would justify us in looking for.

Another fruitful source of difficulty, as forcibly described by Mr. Simpson, is to be found in works that have been at first well executed, but afterwards neglected—sometimes from carelessness, at others from estates passing into the hands of trustees for minors, lunatics, and others, who will not supply the necessary funds. There is, indeed, an act existing, introduced by the present Duke of Newcastle, which was intended to obviate this difficulty, by compelling landowners to clear away obstructions; but it does not appear to apply in all cases, or else is seldom enforced. Again, in how many instances does the respect for mill property allow mischief to remain, greater by tenfold than the whole value of the mill! but there is no general act to compel its removal, or to compensate the owner for it when done. It is clear, then, that the first question is to consider what can be done by legislation making it compulsory on all to agree to one system of drainage, and to provide a revenue by a tax on the improved land for its effective support when made.

The position of the "enclosure of waste lands" question is supposed to be analogous, and the operation of the Enclosure Act was quoted by one speaker, and the manifest advantage in promoting such works by it described. The case, however, in some respects differs from the drainage question. It would be easy for an opponent to a drainage scheme to show that while it might benefit his neighbours higher up, it would be a positive injury to him situated lower down. Also, it would be difficult to estimate the injury, if any, but this is simply admitting that nothing we can do will be without its disadvantages. The question still remains—Are these difficulties sufficient to deter us from attempting the only thing that can set us right? Are we, in fact, to go on as we have done, and stand in the way of future improvement? As legislation is the first thing by which permission to do what is wanting can be obtained, so engineering comes next. Upon this subject the paper of Mr. Grantham gives us much valuable information. His own practice has been largely devoted to the carrying out of extensive drainage works—amongst others, that of the Royal Forest of Hainault, in Essex, of which about 2,000 acres have been reclaimed, and a large number (615 miles) of underground pipes laid.

But the first great question of an engineering character is the outfalls. These are of various kinds, discharging themselves into large rivers or direct into the sea. The latter are those requiring the largest amount of engineering skill, as the most important of them are through lands scarcely, if anything, above the level of the sea; the ground is soft, the deposit of mud is immense, and it has frequently happened that attempts have been made to improve the navigation of the river which forms the natural outlet, and to combine both operations in one, probably sometimes to the detriment of both. These larger works being well designed, attention must be given to the system of drains which are to flow into them. The plans for these are equally varied with the others, but involve less outlay, being on a much smaller scale. Next above these are the small works of individuals, each carried out to the extent which he considers desirable. All, however, require for their efficient action the varied resources of engineers, whose experience has been gained in this peculiar school.

Let the work proceed with system, and the results will generally amply repay even the most liberal expenditure. We cannot, however, pursue this subject farther at present, but hope hereafter to continue its consideration, when we purpose then to review the different features of the paper itself.

THE ROYAL AGRICULTURAL SOCIETY'S SHOW.

THE SHEEP CLASSES.

As the time is at hand when the prize sheet of the Royal Agricultural Society is agreed upon and published, it may not be inappropriate to offer a few plain remarks and suggestions upon its operations as respects the above classes. Hitherto, for the most part, its chief encouragement has been accorded to the old-established breeds of Leicesters, Southdowns, and Long-wools; and of late years its prize sheet has included a series of prizes for the local breeds of the district embraced by the Society for the year of its meeting in that particular district. It is quite correct that at the establishment of this great society these three were the principal, and also the most profitable breeds in the country, and as such deserved the encouragement given to them. But the Society's aim was a large and noble one; it sought to promote improvements of every character in the breeding of farm stock. Hence have arisen several new and splendid varieties of sheep. Some of these have become as distinct and as truly established as separate breeds of sheep, as the Leicester, the Southdown, or the Long-wool breeds. One of the most profitable and best of these modern breeds is the Shropshire Down sheep. This breed may be said to possess the most commendable points of the Southdown and Leicester breeds, such a judicious commingling and blending of the two characters of the animals in size and proportions and in wool as to produce a kind of second-to-none in every phase of their character. They are exceedingly prolific, possess handsome and large well-formed frames, come early to maturity, are very hardy, and yield a great weight both of wool and mutton, both of exceedingly good quality. This breed is also extending itself over a large tract of country, and is fast becoming not only a very numerous, but a very important breed of sheep.

The next distinct breed of a modern character, which ought to be noticed, both for its great value and the extent of country over which it ranges, is the Hampshire Southdown breed. They are not quite so handsome as the Shropshire Down breed, but they possess a fine well-formed frame, their mutton is of excellent quality, and they yield a fleece of very fine Down wool of considerable weight. This breed is much larger in its character than the pure Southdown, and it nearly approaches it in the general contour of frame and appearance; but it must yield the palm of beauty to the Southdown, nor can it altogether equal it in the fine quality of its mutton. In weight and substance, earliness of maturity, and quantity of wool, it is superior. The breadth of country over which it extends is great, and the immense numbers bred give it a degree of importance now, equal to the three favoured breeds above-named.

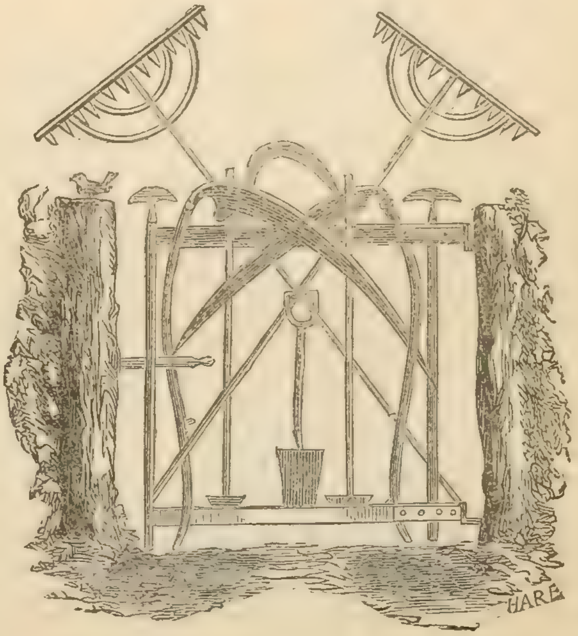
There have been great improvements also made in the breeds of mountain sheep, and when it is considered that a large breadth of our country is depastured by these breeds, and where none other could live, it renders them, as a distinct breed, of great national importance, and deserving the highest encouragement. These varieties are numerous, but one classification includes the whole. The Cheviot is decidedly a mountain sheep, but his great size and proportionate frame entitle him to a higher rank than the small ordinary sheep of the mountains. The Northumberland breeders deserve the greatest credit for the improvements they have effected in this valuable breed, but the range of country over which it extends is rather too limited to entitle it to a separate classification. The various and numerous attempts to establish new breeds by judicious crossings have not yet been fully realized; but there are several old breeds of sheep quite distinct in their character, and some of them highly deserving a distinctive classification as a peculiar breed; and some of them require to be brought before a discerning public, in order that their defects might be pointed out, and their breeders stimulated to improve them—the Romney Marsh sheep, for instance, or the "Old Kents" again, or the old Norfolks, the Rylands, the Teeswater, &c.

There are other very valuable breeds of great importance, for which no proper classification is provided by the Society. The most valuable and numerous of these is the Lincoln long-woolled breed. This breed extends over a very large breadth of country, including a great part of Lincolnshire, East Riding of Yorkshire, the counties of Nottingham, Leicester, Rutland, Derby, Northampton, Huntingdon, Cambridge, Beds, and parts of Norfolk, Suffolk, Herts, Warwick, Stafford, &c. They are nearly allied to the Leicester breed, but possess larger frames, more wool, and that of a longer and rather coarser quality; indeed, they are in a great measure propagated and upheld on account of the extraordinary fleeces they produce, and which makes them so valuable as a distinct breed. In size they are not so large in their general proportions as the Cotswolds, nor are they like them in character; but their fleeces are far superior, and they do not yield a much less weight of mutton. Mr. Robert Smith, in his Chester report, says he has "known 14 months old lamb-hogs slaughtered at Lincoln fair, 30 together, averaging 35lbs. per qr., and 100 together clipped 14lbs. each of washed wool." The writer knows of one clip, shorn this summer, and grazed upon a neighbouring farm—the 324 hogget fleeces yielded 66 tods of 3 fleeces each, and 63 tods of 2 fleeces each. A ewe bred by himself, when slaughtered, weighed upwards of 65lbs. per qr. Also a ram (now living) has yielded above 36lbs. of wool in eight shearings, an average of near 17lbs. of good wool. Many facts like these can readily be adduced, and many to exceed them, both in wool and mutton.

Another feature in their favour is, that the Lincolnshire hogget wool of strong hair or fibre, and averaging about from 10 to 14 lbs. per fleece, is nearly worth as much in the market as the finest qualities, the last quotations being for Lincolnshire long wool 47s. 6d. per tod, for Southdown 50s. Numbers of flocks this year would average in wool per sheep from 14s. to 20s. each. The above clip would average at 45s. per tod (at which price many clips have this season been sold), or about 18s. per fleece. Taking into consideration the total amount of wool and mutton produced by this particular breed of sheep, it is very questionable if we have a more profitable breed in the kingdom, and yet the Society have no separate class for them. If wool of this strength of hair is so well worth growing on our acres, it is worth the specific attention of the Society, and its claims for a separate class are paramount. It cannot compete in the Leicester classes, because they are not pure Leicesters; neither can they favourably compete in the Long-woolled classes, because the gigantic Cotswolds exceed them in size and substance; and thus far this has been held to be the great perfection in these classes.

Now the funds of the Society are in that prosperous state as to permit the extension of its prize list, and this extension to the classes of sheep noticed would not only be an act of justice to the breeders of these classes of sheep, but would bring in a long list of subscriptions from them. The operations of the Society are very large, almost unmanageable as it is. Let more officers, then, be appointed—more judges be selected; these would all be forthcoming if only invited. The thing is easily practicable, and the Council of the Society will act unjustly to the improvers of these breeders if they longer refuse them a place at their vast and most important of all meetings connected with the improvement of agriculture.

MODEL DESIGN FOR A FARM-YARD GATE.



We copy the above engraving from an American paper (*The Agriculturist*). We learn that it is not a fancy sketch taken from the author's brain, but that it is a drawing taken from one which stands at one of the entrances to "Wodenethe," the picturesque and unique residence of H. W. Sargent, opposite to Newburgh, on the Hudson river. It is constructed of wood, and every part of it, even to the latch, is the representation of some implement used in agriculture. These are weapons with which the virgin soil can be made to yield up its golden treasures, and fill the granaries and barns, and the home with luxuries from its rich store-house. The spade, mattock, and hoe have been praised in song:

"It was not the sword that won our best battle,
Created our commerce, extended our trade,
Gave food to our wives, our children, our cattle;

But the queen of all weapons—the spade, boys, the spade."

And thus we might sing of all the various implements, which the cultivator of the soil should feel are his weapons, and have an honest pride in using them.

As few things give more character to the general appearance of a farm than a handsome gate at the entrance; and as the above seems to be most unique, we readily present it to our readers as, if not a valuable, at least an original idea.—Ed. F.M.

THE BIRMINGHAM AND MIDLAND COUNTIES FAT CATTLE AND POULTRY SHOW.

There is now no meeting so generally uniform in its character as that of the Birmingham and Midland Counties. For some years past the Society has reached a certain standard of excellence at which it would appear well content to remain. Although invariably a most successful exhibition, it continues to offer the same strong and weak features that have been so noticeable from the first establishment of the Show. In fact, an old frequenter of Bingley Hall may count with tolerable confidence on what season after season he is to see there. He will be prepared to find the same good entry of Hereford cattle, a creditable display of Shorthorns, and a very select party of Devons. These he knows will be backed by two or three curiosities in the way of Longhorns, about as many Welsh cattle, a pair or so of capital Highlanders, and a few very encouraging Crosses. Then, for sheep, there will be a "really extraordinary" array of Shropshire Downs, some serviceable Leicesters, a few pens of Southdowns, and fewer still of Cotswolds. The fat pigs are sure to be unequalled, and the poultry as altogether unrivalled. The Dorkings will be still rising in repute, and the Cochins as proportionately descending. The Spanish and the game fowl will either be much to be commended, and there will be one lot of geese of unprecedented weight and merit. The Hall itself, the arrangements of the Council, and the getting up of the Catalogue will all be as agreeable, and convenient to the occasion as ever. There will, too, be the like disposition amongst the company to separate into two distinct divisions; one section thronging the poultry avenues, and the other lingering over the high-bred cattle. The very knowing visitor may indeed venture a step further, and go on to apportion the chief prizes even before he has seen a beast or heard of an entry. He will award one Gold Medal to a Hereford steer, and the other to a Shorthorn cow. He will allow His Royal Highness the Prince Consort a certain pre-eminence amongst the Devons, and Mr. Stratton as high a place amongst the Durhams. Mr. Wiley will stand as well with his white pigs, and Mr. Smith with his Shropshire sheep. Bright chanticleer will pitch his clarion note to the praises of Captain Hornby, while ducks will quack again, and geese cackle over the wondrous fame of Fowler of Aylesbury.

In a word, to record the Birmingham Meeting as a good *average* one, is to apply the phrase far more strictly than is perhaps often done. And the recent Midland Counties Show was a good average one. That is to say, it was like as possible in almost every respect to that of 'Fifty-seven, or its fellow in 'Fifty-six. Within a head or so there were precisely the same number of animals in the Hall this year as there were last. Or, turning to the other strong point in the attractions, the pens of poultry ran almost identically even with those of the preceding meeting. The pigs were either one or two more, or one or two less. The Shropshires had had, as usual, the call of the sheep classes. Captain Hornby's Dorkings were once more admirable, and Mr. Fowler's geese very marvels of magnitude. One Gold Medal went to a Hereford steer, and the other to a Shorthorn cow; as they did last year, and as they did the year before that. In short, this was literally an average show; or, as a hard-to-please old gentleman said in the coffee-room at Dee's, "If you've seen it once, you have seen it always, and I sha'nt come any more"—a but ungrateful deduction, though unruffled goodness, as philosophers affirm, is sure to tire.

From the very first, and even in the time of their temporary decline, the summons to Bingley Hall has always brought together a good muster of Herefords. Never, however, has the entry produced a better beast than that which this year takes all the great prizes of the show. Mr. Shirley's steer is not only the best of his class, and the best of all the Herefords, but the best made animal, and the best bred and fed by the same man. And he really deserves this accumulation of honours, notwithstanding that he is scarcely the stamp of Hereford the eye has latterly been accustomed to. He is darker in colour, rougher in the coat, shorter on the leg, and with a spotted, or more properly a mottled face, in place of the pure white now so commonly accepted as a signal of the sort. But it is a question whether all these diversities be not in his favour. As was said in our report of Hereford Fair, the mottled faces were once the great favourites, and Mr. Shirley's ox may bring them round again. He is, to begin with, of excellent quality, and with a coat thick and rough, but at the same time beautifully fine in its texture—a happy combination that argues hardihood of constitution and goodness of flesh. Then he has a sweet head, a deep, famously filled frame, and altogether the style of a superior healthy animal. It is almost ungrateful to find fault with so good a specimen of what a Hereford should be, and that breeders will do well to keep in their eye; but he has a very perceptible dip in the back, stands a little in behind, and finishes rather narrow over the quarter. This steer is becomingly associated with Lady Emily Foley's Hereford prize cow, of a somewhat different stamp, certainly; but a very grand type of her breed. Still her ladyship only stood second here to a party-coloured cow of Mr. Naylor's, that, however good in her way or true in her pedigree, had little of the characteristics of the Hereford in her appearance. The common feeling in the hall was one of surprise as to how she could have got placed where she was. It is only fair to say that she is by a rather famous bull called The Knight, himself a white animal, and prone to get his stock somewhat fancifully marked. Mr. Hill, of Golding, claimed second place in both the young classes of Herefords, with two very handsome things. Of course he was beaten fairly enough by the Gold Medal steer, but by no means so satisfactorily by the heifer shown against him. There were only three exhibited, and the judges gave Mr. Roberts the first prize, Mr. Hill the second, and then highly commended Mr. Steadman's entry. On their previous meeting, at Ludlow, Mr. Hill's heifer took the first prize, and that of Mr. Roberts was "nowhere." Unfortunately, the latter is not coming on to Baker-street, so there will be no chance for the deciding heat. The Ivingtonbury heifer is bigger and coarser than Mr. Hill's, but then she is nearly a year older, while she lacks much of the quality and beauty by which the other is so distinguished. Lord Aylesford's first prize ox is a fine large useful beast, but one that shows himself to great disadvantage. Like the Indian jugglers' goats, which are taught to stand with the four legs on the point of a pole, he was "all of a heap," with his back set up, and his head and tail down. No doubt he would look far better out. There were some other good Herefords, more especially amongst the steers, but the general class of them ran rather into "all sorts", and the orthodox red coat broke out into grey, white, or even one of "many colours."

There are many who will expect to find the merits of the Gold Medal beasts at Birmingham as signally confirmed this week at the Smithfield Club. And, certainly, as far as the cows are concerned, this would seem to be insured. It is rarely, indeed, that any animal has united such size and weight with so much style and quality as is to be seen in Beauty's Butterfly. At three years and-a-half old she measures nine feet and one inch round the girth, is very heavily fleshed, and as evenly fed. Then she has a lovely head, an extraordinary back, and a beautiful touch. In a word, no one animal ever showed so well for the Uses and Graces, and the only regret will be to see her prepared so early for the sacrifice. As her name indicates, by the famous Master Butterfly, and herself of such promise, the natural question is, how was it that as early as the summer of this season she stood merely as a fat beast at the Yorkshire Show? The answer is that the Beauty, although not a free martin, has never evinced any sign or disposition to breed, and hence her early doom. Another cow of the Colonel's, The Rose of Towneley, the first of her class here, and little over four years old, accompanies her to the shambles, and Mr. Stratton yields up a Matchless to the same inexorable fate. This cow had once the credit of beating her half-sister, the Warwick prize cow, although the award was thought to be a mistake. Still, good as she is, the credit of the Hinton herd rests again on the Smithfield Club Gold Medal steer of last Christmas, and the first of his class then, as now at Birmingham. Magnificent in his points as this beast still continues, he has hardly fulfilled the promise made for him, neither does he handle quite as kindly as might be. In fact, the more we see of this fashion of preparing an animal over and over again, the less we are inclined to uphold it. Some two or three Christmases back, a Devon turned up at Bingley Hall, after one or two years' absence, during which he had been training on as a fat animal, and figuring both in England and France, but with anything but uninterrupted success. He was, in fact, as most fat animals will be, all the worse for keeping, and we spoke strongly, at the time, of the absurdity of the system, and the questionable policy of encouraging it. It is a weak place in the direction of the Midland Counties' Meeting; and the sooner they assimilate their standing orders with the Smithfield Club rule—that an animal shall be exhibited but once —the more will the Society be in character with the great national object and intention. It is even doubtful whether Colonel Towneley's beautiful heifer, though now so ripe, may not return to her stall. If so, could she continue taking the Gold Medal here for the next year or two?—In the cow class, for instance, next time? Mr. Stratton, however, did sell his ox in Baker-street for £70, but he was back again at Hinton in a fortnight for £50, having been seized with distemper almost immediately after leaving the yard. So far, moreover, was he recovered, that the Shorthorn Judge long stood out for him as the Gold Medal ox, but he was eventually outvoted. The second prize in this class, Mr. Hewer's ox, was remarkable as a *shorthorn* with a decidedly *long* horn. But steers occasionally run to such lengths, and with Booth blood on one side, and Bates on the other, there should be nothing amiss in his character. Still this was not an animal of much appearance; and it must have been his touch that carried his place for him. Mr. Lovell Cowley had unmistakably the best of the Shorthorn steers, and Lord Spencer, Mr. Overman, and Mrs. Dunkley had some fair, but by no means first-class stock in this section. The Prince Consort also showed a Shorthorn, the second he has ever yet exhibited, but without his customary success. As usual, His Royal Highness was more fortunate with the Devons, although a mistake in the entry was nearly depriving him of the credit of breeding his own steer. The show of this sort was even less than usual, but Mr. Heath promises to maintain its repute in London with an ox, that is to beat Mr. Shirley's for the Medal.

The two or three Longhorns were better and *broader* than we have ever yet seen them. There were in all two Welsh cattle, with rather more Scotch, Mr. M'Combie himself upholding the black polled, and the Duke of Beaufort again supporting the Highlanders. The crosses were as interesting as ever; but in this place, the catalogue, for a wonder, is weak. Of course the whole value of a cross rests upon the way in which it is achieved, and the entry of such description of stock cannot be considered perfect without these particulars. As to seeking information from a herdsman, he frequently either does not or will not know. We were calmly assured that one beast entered as a "cross" was got by a Shorthorn bull out of a Shorthorn cow! And the man, though previously civil enough, was rather indignant when we ventured to doubt so legitimate a means for obtaining half-bred produce!

The attractions of the sheep show centered this season more than ever over the Shropshires. They had for the first time a distinct class to themselves, while a movement was commenced to obtain a similar recognition of their rights at the meetings of the Royal Agricultural Society. The convocation on Monday resulted in the adoption of the following resolutions, which tell their own story: "That in the opinion of this meeting the time has arrived when it is most desirable that some united efforts should be made for the purpose of inducing the Council of the Royal Agricultural Society of England to open separate classes for the Shropshire sheep at the annual country meetings of that society."

"That in order to carry out the foregoing resolution, the subjoined memorial to the Council of the Royal Agricultural Society of England be adopted by this meeting, and signed by the Chairman; and that the Chairman, the Earl of Dartmouth, the Earl of Aylesford, Edward Holland, Esq., M.P., and William Orme Foster, Esq., M.P., be and are hereby respectfully requested to obtain an interview with the Council when the prize lists for the Canterbury Meeting are under consideration, to present such memorial, and to support the prayer thereof:"

TO THE COUNCIL OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The Memorial of Breeders of Shropshire Sheep, assembled at Birmingham, this 28th day of November, 1859—

SHOWETH,—That in the opinion of your memorialists, the claims of the Shropshire Sheep to be considered a pure breed have now been fully established.

That the Shropshire Sheep have been exhibited in considerable numbers at some of the Country Meetings of your Society, and especially at Gloucester, Chester, and Warwick; the entries for the latter place being not less than one hundred and twenty-five pens, exceeding the number of entries of any other breed at the same meeting.

That successive Stewards of Stock at the Meetings of your Society have declared their appreciation of the value of the Shropshire breed of Sheep; and that in one instance, namely, in the report on the stock exhibited at Gloucester, the Steward acting on the occasion expressed a hope that the Society would in future recognize them as a distinct breed.

That the Shropshire Sheep have long been distinguished for their size, early maturity, and quality, characteristics which have led to their being preferred above any other breeds in the general markets of those districts in which they are already established; while the long-acknowledged superiority of their wool, vigour of constitution, and hardihood, are additional properties of great importance.

That during the last ten years the Shropshire Sheep have been introduced into many parts of the United Kingdom, and purchases are now being constantly made by agriculturists in the principal sheep counties for the purpose of founding new flocks; and the fact that so many tenant farmers who are not usually exhibitors of stock have adopted this breed to the exclusion of other breeds or cross-bred sheep, is also, in the opinion of your memorialists, another striking proof of their excellence.

That on these grounds your memorialists respectfully urge your Council to open separate classes for Shropshire Sheep at the future Country Meetings of your Society, believing, as they do, that such a concession would be received with satisfaction by a large portion of the Members of your Society, and that it would tend to promote the great object which your Council has in view in offering prizes for stock—the encouragement of pure breeds, without which the value of agricultural stock generally cannot be maintained.

We have always spoken to the great merits of the Shropshire Downs as a most useful and rising breed of sheep. The only question is whether they are as yet kept sufficiently pure, and to themselves, to warrant their taking place over the Hampshire and West Country Downs as a distinct breed? Had not, indeed, one of the gentlemen who will go up with and support this memorial a pen of Shropshire sheep in Bingley Hall, with so strong a cross of the Southdown in them as to be at once recognizable? Have not other as famous flocks very recently had a strain of the Cotswold? The purest-bred Shropshire sheep in the yard, and at the same time amongst the worst, were those of Lord Aylesford. It is, of course, only fair and creditable to improve a middling animal into a good one; but have the Shropshire breeders quite accomplished this? Considering the extent to which their sheep are now used, and the numbers they are shown in at our national meetings, the matter rests entirely here:—Are they strong enough to go alone? If so, give them a class, by all means. If not—if a cross of another sort is still occasionally necessary—it will be difficult where to draw the line, or to declare what should not have rank of its own. Mr. Smith, of Sutton Maddock, Mr. Holland, Mr. Hand, and Mr. Orme Foster, all furnished some appropriate illustrations of the New Order. Mr. Smith's prize wethers were the commended yearlings of last year, and with a small flock this gentlemen, a tenant farmer of some two hundred acres, is really doing wonders.

Mr. Foljambe's Leicesters were very good, and perhaps the best ever seen here. They had more size and substance, but still with all the quality, the clean head, and fine Leicester leg the hard-riding exquisite was wont to covet as the model to pull a boot over. Mr. Overman's Downs, again, were very pretty; compact of frame, with good backs and rare heads. But the general show of Southdowns was mediocre, and Lord Leicester alone appeared to have two or three patterns, some with almost white faces, and long-wool heads. Neither were Lord Walsingham's sheep equal to what we have seen, but the strength of the Merton flock may be in reserve for Smithfield. There were three pens of Cotswolds, the prize sheep of which division had this note added on to the award:—"*The Judges complain of the unfairness of the way in which the sheep in this pen had been shorn;*" and very properly too: the only matter for surprise is that they did not complain of two-thirds of the sheep they inspected. In the Leicester and Southdown classes more particularly, the manner in which some of the animals were trimmed into form was really disgraceful, and little short of a positive insult to the spectator. It is hard to understand how judges can continue to pass such glaring abuses. However, at the meeting of the Smithfield Club tomorrow morning, Mr. Valentine Barford, one of our oldest flock-masters, is to bring the matter formally before the members. It is to be hoped this will not be without some very strong effect, or the art of shearing and showing a sheep will gradually demoralize the whole agricultural community. Thimble-rigging or horse-chanting is nothing to it as one of the occult sciences.

Mr. Crisp, a new man here, added materially to the already strong show of pigs by his entries of both white and black Suffolks. The latter are at present almost entirely in his own and his family's hands, but their many manifest merits are sure to speak for them. The Berkshire breeding pigs are still getting better and better here. Mr. Smith's (Henley-in-Arden) prize pen of five were very uniform in their character, and good in their quality: they trace back to a boar from Mr. Hewer. The fat pigs were quite up to the Birmingham average, and that is saying a great deal for them; while Mr. Wiley lost none of his repute with the young whites, although Mr. Mangles is creeping up. Lady Chesterfield, too, well maintains the claims of the Bretby variety, and Mr. Morland, Mr. Cartwright, and Sir Francis Holyoake Goodricke were all deservedly distinguished. It may tend something to show the excellence of the entry, when the Prince Consort, with his famous white Windsors, gets no higher than a commendation. White, indeed, was the favourite hue, while the curious coloured Tamworths seem to have almost gone out.

The Root show, although now an established part of the programme, only made up a moderate display. In fact, there were better roots on the stalls of some of the seedsmen and manure-dealers than any of those entered for competition. The Poultry we have already referred to. It was once more declared to be the finest collection ever brought together. The great class was that of the coloured Dorkings, the white being by no means so excellent. Then, the Game are always in force here. The run has now for some time been on the black-breasted reds with the willow or slate leg, and this to the manifest neglect of the Piles, which are quite in the shade. A good game cock, however, can hardly be of a bad colour, and like the thorough-bred horse, he crosses well with almost anything. The Game and the Dorking "nick" is said to be magnificent. The Spanish quite maintain their position, although the black leg will be always against them in the eyes of a good housewife as a table bird. Even the Cochins were pronounced, on the argument of what was sent here, to be coming again. For our own part, we agree with one of the most experienced judges we have, who considers they have done far more harm than good to the farm yard fowl of this country. There were, as usual, almost infinite varieties of other kinds, with some of the most beautiful of bantams, and most curious of pigeons. The turkeys were magnificent, and Mr. Fowler's three geese reached seventy-five pounds. The poultry fanciers, like the Shropshire Down men, are also about to memorialize the Council of the Royal Agricultural Society. It is admitted that old birds do not show to advantage in the summer, but it is thought that a Chicken Class would tell, and this is the prayer of the petitioners.

A dog show at the Repository added to the attractions of the earlier days of the meeting. It was supported by entries from the teams of Lord Lichfield, Lord Spencer, the Hon. W. Vernon, Sir Thomas Lennard, and a number of other good sportsmen. The prize list included classes of large and small pointers, setters, retrievers, and spaniels. Lord Lichfield's small pointer bitch was quite a picture of what she should be, and there were some handsome retrievers, one or two very stylish setters, and a few brace of good Clumbers. There is no reason why the dog show should not work on. But it should be nearer to Bingley Hall, or why not in the Hall itself? There is an off corner at present allotted to a few of the young pigs, that would make a capital kennel.

The only business of any importance at the General Meeting of the subscribers, on Thursday, was the election of his Grace the Duke of Marlborough as President of the Society for the ensuing year.

PRIZE LIST.

FAT CATTLE.

Judges.—Mr. Philip Halse, Molland, South Molton, Devon.
Mr. William Sanday, Holme Pierrepont, Nottingham.
Mr. John Williams, St. Mary's, Kingsland, Leominster.

HEREFORDS.

Oxen or Steers.

First prize, 10*l*., the Earl of Aylesford, Packington Hall. Silver medal to breeder, Mr. William Tudge, Ashford, Ludlow.

Second, 5*l*., Mr. William Aldworth, Frilford, Abingdon.

Commended, Mr. John Naylor, Leighton Hall, Welshpool.

Steers.

First prize, 10*l*., the President's prize of 25*l*. as the best ox or steer bred and fed by an exhibiter, the extra prize of 20*l*. as the best Hereford, the Gold Medal as best of all the oxen, and silver medal as breeder, Mr. Richard Shirley, Bawcott, Munslow, Shrewsbury.

Second, 5*l*., Mr. Richard Hill, Golding Hall, Shropshire.

Commended, Mr. John Naylor, Leighton Hall; and Lord Bateman, Shobdon Court, Herefordshire.

Cows.

First prize, 10*l*., and silver medal as breeder, Mr. John Naylor, Leighton Hall, Welshpool (had one calf born alive, and one dead).

Second, 5*l*., Lady Emily Foley, Stoke Edith Park, Herefordshire (had one calf born alive).

Highly commended, Mr. Samuel Walker Urwick, Leinthall Starks, Ludlow (had three calves born alive).

Heifers.

First prize, 10*l*., and silver medal as breeder, Mr. Thomas Roberts, Ivington Bury, Leominster.

Second, 5*l*., Mr. Richard Hill, Golding Hall.

Highly commended, Mr. William Steadman, Bedstone Hall, Aston-on-Clun, Shropshire.

SHORTHORNS.

Oxen or Steers.

First prize, 10*l*., and silver medal as breeder, Mr. Richard Stratton, Broad Hinton, Swindon.

Second, 5*l*., Mr. William Hewer, Sevenhampton, Highworth.

Highly commended, Mrs. Dunkley, Rothersthorpe, Northamptonshire.

Commended, Earl Spencer, Althorp, Northamptonshire; and Mr. Henry Lambert, Wauldby, Brough Hall, Hull.

Steers.

First prize, 10*l*., and silver medal as breeder, Mr. Lovell Cowley, Ashby St. Ledgers, Rugby.

Second, 5*l*., Earl Spencer, Althorp.

Commended, Mr. John Overman, Burnham Sutton, Burnham Market, Norfolk.

Cows.

First prize, 10*l*., and silver medal as breeder, Lieut.-Col. Charles Towneley, Towneley, Burnley, Lancashire (had one calf born alive)—"Rose of Towneley."

Second, 5*l*., Mr. Richard Stratton, Broad Hinton (had one calf born alive)—"Matchless 3rd."

Commended, Mr. Robert Swinnerton, Weddington, Nuneaton (had one calf born alive).

Heifers.

First prize of 10*l*., the extra prize of 20*l*. as best Shorthorn, the Gold Medal as best of all the cows or heifers, and silver medal as breeder, Lieut.-Colonel Charles Towneley, Towneley Park,—"Beauty's Butterfly."

Second prize, 5*l*., Mr. William Aldworth, Frilford, Abingdon.

Highly commended, the Countess of Aylesford, Packington Hall; and Mr. Robert Swinnerton, Weddington.

DEVONS.

Oxen or Steers.

First prize, 10*l*., and extra prize of 20*l*. as best Devon, Mr. James John Farquharson, Langton House, Blandford; silver medal to breeder, Mr. James Quartley, Molland House, South Molton, Devon.

Second, 5*l*., Mr. William Heath, Ludham Hall, Norwich.

Commended, Earl Howe, Gopsall Hall, Atherstone.

Steers.

First prize, 10*l*., and silver medal as breeder, His Royal Highness the Prince Consort, Windsor Castle.

Second, 5*l*., Mr. John Overman, Burnham Sutton.

Commended, the Prince Consort, for another steer; and the Earl of Leicester, Holkham Hall, Norfolk.

Cows.

First prize, 10*l*., Mr. William Heath, Ludham; silver medal to breeder, Mr. James Quartley, Molland, South Molton, Devon (had five calves born alive).

Second, 5*l*., Mr. George Turner, Barton, Exeter (had five calves born alive).

Heifers.—No entry.

LONGHORNS.

Oxen or Steers.

Prize, 5*l*., and silver medal as breeder, Mr. W. T. Cox, Spondon Hall, Derby.

Cows or Heifers.

First prize, 10*l*., and silver medal as breeder, Mr. W. T. Cox, Spondon Hall (had three calves born alive).

Second, 5*l*., Mr. R. H. Chapman, Upton, Nuneaton (had one calf born alive).

Commended, Mr. Joseph Holland Burbery, The Chase, Kenilworth (had one calf born alive).

OTHER PURE BREEDS and CROSS-BRED ANIMALS.

Oxen or Steers.

First prize, 10*l*., and silver medal as breeder, Mr. John Beasley, Chapel Brampton, Northamptonshire.

Second, 5*l*., Mr. Richard Hawkes, Hunscote, Charlecote, Warwickshire.

Commended, Mr. John Carwardine, Stockton Bury, Leominster, Herefordshire.

Cows.

First prize, 10*l*., and silver medal as breeder, Mr. Aaron Pike, Mitton, Tewkesbury (cross—had one calf born alive).

Second, 5*l*., Mr. T. R. B. Cartwright, Aynhoe, Brackley (Polled Angus—had four calves born alive).

Heifers.

First prize withheld.

Second, 5*l*., Mr. John Faulkner, Bretby Farm, Burton-upon-Trent (Short-horn cross).

SCOTCH BREEDS.

Oxen or Steers.

First prize, 10*l*., and silver medal as breeder, Mr. William McCombie, Tillyfour, Aberdeen (Polled Angus).

Second, 5*l*., the Duke of Beaufort, Badminton, Chippenham, Wilts (West Highland).

WELSH BREEDS.

OXEN OR STEERS.

First prize, 10*l.*, Mr. Richard Doig, Sunny Cottage, Long Buckby, Northampton; silver medal to breeder, Mr. John Jones, Tynllan, Llansadwrn, Anglesea.

Second, 5*l.*, Mr. John Ewins Bennett, Bosworth Grange, Leicestershire.

EXTRA CLASSES.

(For animals not qualified to compete in any of the preceding classes.)

OXEN OR STEERS.

Prize, 5*l.*, Mr. Robert Swinnerton, Weddington; silver medal to breeder, Mr. Richard Hall, Great Barford (Short-horn).

COWS OR HEIFERS.

Prize, 5*l.*, and silver medal as breeder, Earl Howe, Gopsall Hall (Short-horn).

SHEEP.

JUDGES—Mr. John Moon, Old Alresford, Hampshire.
Mr. Charles Randall, Chadbury, Evesham.
Mr. J. B. Spearing, Moulsford, Wallingford, Berks.

LEICESTERS.

Three fat Wethers, not exceeding 22 months old.

First prize, £10, the extra prize of £10 as best pen of long-wools, and silver medal as breeder, Mr. G. S. Foljambe, Osberton Hall, Worksop.

Second, £5, Mr. G. S. Foljambe.

LONG-WOOLLED, NOT BEING LEICESTERS.

Three fat Wethers, not exceeding 22 months old. (All Cotswolds.)

First prize, £10, and silver medal as breeder, Mr. Jonathan Davis, Webton Court, Herefordshire.

(*The judges complained of the unfairness of the way in which the sheep in this pen had been shorn*)

Second, £5, Mr. William Hewer, Sevenhampton, Highworth.

SOUTH AND OTHER DOWNS.

Three fat Wethers, not exceeding 22 months old.

First prize, £10, and silver medal as breeder, The Earl of Leicester, Holkham Hall, Norfolk. (Southdown.)

Second, £5, Mr. G. S. Foljambe, Osberton Hall. (Southdown.)

SOUTH AND OTHER DOWNS.

Three fat Wethers, exceeding 22, but not exceeding 34 months old.

First prize, £10, extra prize of £10 as best pen of Short-wools, and silver medal as breeder, Mr. John Overman, Burnham Sutton, Burnham Market. (Southdown.)

Second, £5, Lord Walsingham, Merton Hall, Thetford, Norfolk. (Southdown.)

Commended—Lord Walsingham, Merton Hall, for another pen. (Southdown.)

SHROPSHIRE.

Three fat Wethers, not exceeding 22 months old.

First prize, £10, and silver medal as breeder, Mr. Edward Holland, M.P., Dumbleton Hall, Evesham.

Second, £5, Mr. James Hand, Ludlow.

SHROPSHIRE.

Three fat Wethers, exceeding 22, but not exceeding 34 months old.

First prize, £10, and silver medal as breeder, Mr. Henry Smith, jun., Sutton Maddock, Shiffnal.

Second, £5, Mr. Henry Smith, jun., Sutton Maddock.

Commended—Mr. William Orme Foster, M.P., Kinver Hill Farm, near Stourbridge; and Mr. Edward Holland, M.P.

CROSS-BRED.

Three fat Wethers, not exceeding 22 months old.

First prize, £10, and silver medal as breeder, Mr. John Overman, Burnham Sutton. (Southdown and Leicester.)

Second, £5, exhibitor, Mr. George Wallis, Hinton, Waldridge, Berkshire. (Cross.)

Commended—Mr. George Wallis, Hinton. (Cross.)

CROSS-BRED.

Three fat Wethers, exceeding 22, but not exceeding 34 months old.

[No entry.]

PIGS.

JUDGES—Mr. John Moon, Old Alresford, Hampshire.
Mr. Charles Randall, Chadbury, Evesham.
Mr. John B. Spearing, Moulsford, Wallingford, Berks.

Three fat Pigs of one litter, not exceeding 10 months old.

First prize, £10, and silver medal as breeder, The Countess of Chesterfield, Bretby Hall, Burton-upon-Trent. (White.)

Second, £5, Mr. George B. Morland, Chilton Farm, Harwell, Berkshire (white).

Commended.—Mr. Thomas R. B. Cartwright, Aynhoe, and Mr. Thomas Crisp, Butley Abbey, Market Wickham (improved black Suffolk).

Three fat Pigs of one litter, not exceeding fifteen months old.

First prize, £10, and silver medal as breeder, Mr. George Beale, Frolesworth, Lutterworth (improved Leicester).

Second, £5, Mr. George B. Morland, Chilton Farm, Harwell (white).

Highly commended.—The Prince Consort, Windsor Castle (white), and Mr. Frederick W. Butler, Tythe Farm, near Abingdon.

Commended.—Mr. Thomas Crisp, Butley Abbey (black Suffolk).

Fat Pig, exceeding fifteen months old.

First prize, £6, Mr. Thomas Crisp, Butley Abbey, silver medal to breeder, Mr. Arthur W. Crisp, Chillesford, Wickham Market (improved black Suffolk).

Second, £3, Mr. Thomas Crisp (improved black Suffolk).

Commended.—Mr. Thomas Crisp (white Suffolk), and Mr. Thomas Crisp, for another (white Suffolk).

BERKSHIRE BREEDING PIGS.

Five Pigs of one litter, exceeding three, and not exceeding six months old.

First prize, £10, and silver medal as breeder, Mr. Joseph Smith, Henley-in-Arden.

Second, 5*l.*, Sir F. L. H. Goodricke, Bart., Studley Castle.

Silver medals to Sir F. L. H. Goodricke, Bart., Studley Castle, for another pen; to Mr. G. Holyoak, Neachley, Shropshire; and to Mr. Walter J. B. Scott, Queen's Hotel, Birmingham.

Commended.—Mr. William Cooper, Ipsley Farm, Henley-in-Arden.

OTHER LARGE BREEDS.

Five Pigs of one litter, exceeding three, and not exceeding six months old.

First prize, 10*l.*, and silver medal as breeder, Mr. Andrew Guy, Eaton, Leicestershire (white).

Second, 5*l.*, Mr. Wm. Bradley Wainman, Carhead, near Cross Hills, Yorkshire (white).

SMALL BREEDS.

Five Pigs of one litter, exceeding three, and not exceeding six months old (all white).

First prize, 10*l.*, and silver medal as breeder, Mr. Samuel Wiley, Brandsby Yorkshire.

Second, 5*l.*, Mr. George Mangles, Givendale, Ripon.

Silver medals to the Rev. Frederic Thursby, Abington Rectory, Northampton; Mr. Samuel Wiley, Brandsby, for another pen; and to Mr. George Mangles, Givendale, for another pen.

Commended.—The Prince Consort, and Mr. Joseph Hindson, Barton House, Everton, Liverpool.

REFEREE FOR THE AGES OF STOCK.

Professor Simonds, Royal Veterinary College, London.

VETERINARY INSPECTOR AND GENERAL REFEREE.

Mr. R. L. Hunt, Canon-street, Birmingham.

ROOTS.

JUDGE.—Mr. J. Mathews, Edgbaston House, Birmingham.

The First Silver Cup, value Ten Guineas, given by the Mayor of Birmingham, for the best collection of Long Mangold Wurzel, Globe Mangold Wurzel, Swedes, and Carrots, six roots of each, Sir William Heathcote, Bart., M.P., Hursley Park, Winchester, Hampshire. Second cup, value five guineas, Mr. Richard Benyon, Englefield House, Reading.

Commended. — Mr. Thomas Keable Rowdefield Farm, Devizes.

LONG MANGOLD WURZEL.

First prize 2 gns., Mr. Charles Pratt, Stratford-upon-Avon; second, 1 gn., Mr. William Horsburgh, Bournefield Farm, Reading.

GLOBE MANGOLD WURZEL.

First prize, 2 gns. Mr. Charles Pratt, Stratford; second, 1 gn., Mr. William Horseburgh, Bournefield.

Commended.—Mr. Richard Benyon, Englefield, and Sir William Heathcote, Bart., M.P.

SWEDES OF ANY VARIETY.

First prize 2 gns., Mr. T. R. B. Cartwright, Aynhoe, (Sutton's Champion); second, 1 gn., Mr. John K. Fowler, Prebendal Farm, Aylesbury.

Commended, Mr. George B. Morland, Esq., Chilton; Mr. William Cox, Brailsford Hall, Derby; and Mr. Thomas Keable, Rowdefield.

COMMON TURNIPS.

First prize, 2 gs., Mr. Charles Kearsey, Glewstone, Ross; second, 1 gn., Mr. George B. Morland, Chilton.

Commended.—The Duke of Portland, Chipstone Park Farm, Mansfield; and Mr. George Mangles, Givendale.

CARROTS OF ANY VARIETY.

First prize of 2 gns., Mr. G. S. Foljambe, Osberton Hall, (White Belgian) second, 1 gn., Mr. John Mallabey Baker, Hall End, Tamworth.

OX CABBAGE.

No merit.

POTATOES.

First prize, 2 gs., Mr. Thomas Halford, Newbold-upon-Stour, Shipston-upon-Stour (White Blossom Kidney); second, 1 gn., Mr. George Mangles, Givendale.

JUDGES OF POULTRY.

George James Andrews, Esq., Dorchester
Mr. John Baily, Mount-street, Grosvenor-square, London;
Mr. Thomas Challoner, Whitwell, Chesterfield;
Mr. Edward Hewitt, Eden Cottage, Sparkbrook, near Birmingham;
The Rev. Robert Pulleine, The Rectory, Kirby Wiske, near Thirsk.

JUDGES OF PIGEONS.

Mr. T. J. Cottle, Pulteney Villa, Cheltenham;
Mr. Harrison Weir, Lyndhurst-road, Peckham, London.

RUTLAND AGRICULTURAL SOCIETY.

MEETING AT OAKHAM.

Upon the eve, as it were, of another season of rejoicing, we are again called to the gratifying task of recording the proceedings in connection with a *re-union* which annually brings with it a variety of social pleasures—we allude to the Christmas assembly of the Rutland Agricultural Society, which took place at Oakham, on Wednesday, Nov. 30. The English—and farmers especially—are strongly gifted with the rural feeling; they possess a quick sensibility to the beauties of nature and a keen relish for the pleasures and enjoyments of the country. This feeling seems inherent in them, and is, perhaps, never more observable than at agricultural meetings. These annual gatherings serve to bring landlords and tenants together on terms of free discussion and good fellowship; a friendly and beneficial rivalry is promoted; the bonds of society are drawn more closely; the condition of the people is improved; and (as has been so often noticed in this county), a very effective impulse is given to agricultural progress. Never were the good effects of societies like these more pleasantly illustrated than at the recent meeting at Oakham, at which means of obtaining knowledge were ample, and the day's enjoyment was crowned with a first-rate social festival.

On the whole a better show of stock was not seen than the one which graced the Riding School on Wednesday. Each class was well-filled with competitors, and, generally speaking, the quality of the animals exhibited was, as is usual in this county, of a high order. In the classes for oxen, steers, and heifers, there were some splendid specimens. The three years and eight months old steer belonging to Mr. T. Swingler, of Langham, and which carried off the principal prize in Class 1, was much admired. In all its points this animal was symmetrical, and reflects great credit upon its owner, who is the breeder and feeder. The second prize ox (in the same class) belonging to the Marquis of Exeter, although not quite so nicely proportioned, is a fine specimen, and attracted considerable attention: it is three years and eleven months old, and has been fed on linseed-cake, bean and barley-meal, and vegetables. In this class a fine ox belonging to Mr. Wortley, of Ridlington, had a number of admirers. We have not space to notice in detail every animal which deserves remark, but before closing a brief sketch of this department of the show, we must not omit to make a passing allusion to the prize oxen exhibited by the Earl of Gainsborough and R. W. Baker, Esq., which were perfect specimens, and (except so far as age was concerned), equal, if not superior, to the stock exhibited in the first class. Mr. Payne, of Stamford, has purchased for the ensuing Christmas the second prize steer in Class 5, exhibited by R. W. Baker, Esq., of Cottesmore. There was a decline in the show of hunting horses: both in respect to quality and number, it was not equal to the exhibitions of former years. The sheep-pens were again well filled with first-class specimens; and foremost upon the list of successful competitors was Mr. C. Bradshaw, of Alstoe House, who, although having to contend with the Marquis of Exeter, the Hon. Col. Lowther, and other owners of high repute, had the good fortune to carry off no less than five first prizes out of six classes. There was an excellent show of pigs, two remarkably fine ones belonging to Mr. W. Carver, of Ingarsby, being especially noticed. The tenant-farmers' heifer class was generally commended by the judges.

Outside the hall there was exhibited some fine roots. Some fine specimens of the kohl rabi (a new vegetable of the turnip species), and superior carrots grown on the Earl of Gainsborough's farm from a crop of 27 tons per acre, were highly commended.

Before dawn on the show day there was a fall of snow. The weather, however, was favourable for visitors, and the town presented a very busy aspect. Amongst those who visited the Riding-house were the Hon. Colonel Lowther, George Finch, Esq., the Hon. G. J. Noel, M.P., the Hon. Gilbert Heathcote, M.P., the Rt. Hon. Sir John Trollope, J. M. Wingfield, Esq., R. W. and W. H. Baker, Esqs., W. R. Morris, Esq., J. Morton, Esq., &c. Nearly 500 were admitted, and the receipts at the doors amounted to £24 15s., being an advance upon the sum taken last year. Upon this occasion the enclosure was comfortably warmed by the aid of gas burners, twenty branches being suspended from the roof of the building. Considering, that the weather was severe, this arrangement (which will be continued) was a great improvement.

JUDGES OF STOCK.—R. G. F. Howard, Esq., Dunholme Lodge, Lincoln; W. Inett, Esq., Asfordby, Leicestershire;

Robert Smith, Esq., Emmett's Grange, South Molton, Devo shire.

Judges of Hunting Horses.—G. H. Finch, Esq., Burley Hall; Sir H. Edwards, Bart., Melton Mowbray; the Right Hon. Sir John Trollope, Bart., Casewick Hall.

Judges of Vegetables.—Mr. Robert Carver, Ingarsby; Mr. W. Shipman, Waltham; Mr. William Morton, Oakham.

The following is the

AWARD OF PREMIUMS.

To the feeder of the best Fat Ox or Steer, £15, to Mr. Thomas Swingler, of Langham; second, £7, to the Marquis of Exeter.

Oxen or Steers, of any breed or weight, under four years of age. First prize, £10, to R. W. Baker, Esq., of Cottesmore, second, £5, to the Earl of Gainsborough.

Cows or Heifers, of any breed, age, or weight. First prize £10 to Sir Thomas Whichcote, Bart., of Aswarby Park; second, £5, to Mr. C. J. Bradshaw, of Alstoe House, Burley-on-the-Hill.—Commended: R. W. Baker, Esq.

To the owner, being a tenant-farmer, of the best Steer, under three years of age. First prize, £7, to R. W. Baker, Esq.; second £3, to Mr. Samuel Wallis, of Barton Seagrave.

To the owner, being a tenant farmer, of the best Steer, under two years of age. First prize, £5, to Mr. C. J. Bradshaw; second, £3, to R. W. Baker, Esq.

To the owner, being a tenant farmer, of the best Heifer, above two and under three years of age. First prize, £6, to Mr. T. Chapman, of Whitwell; second, £3, to Mr. Joseph Tirrell, sen.

To the owner, being a tenant farmer, of the best Heifer, under two years of age. First prize, £4, to Mr. J. Lynn, of Stroxton; second, £2, to Mr. Thomas Swingler.—This class generally commended.

Offered by Stafford O'Brien, Esq.

To the owner, being a tenant farmer, of the best Cow in milk. First prize, 5*l*., to Mr. T. Chapman; second, 2*l*., to Mr. T. W. Fowler, of Exton.—Commended: Mr. Joseph Woods, of Langham.

Offered by the Society.

To the exhibitor of the best Bull, above one and under four years of age. First prize, 10*l*., to Mr. J. Lynn; second, 5*l*., to Mr. R. L. Swingler, of Ketton.—Commended: R. W. Baker, Esq.

To the exhibitor of the best Mare, 3*l*., to Mr. Josiah Royce, of Seaton Mills.—Commended: R. W. Baker, Esq.

To the exhibitor of the best yearling Gelding or Filly for agricultural purposes, 3*l*., to Mr. J. Morton, Egleton.

Offered by the Earl of Gainsborough.

(To tenant occupiers of not more than 30 acres in the district.)

To the owner of the best Cow in milk, 5*l*., to Mr. G. Chester, of Waltham; second, 2*l*., to Mrs. J. Harris, of Langham

To the owner of the best Heifer, under three years old at the time of showing, 4*l*., to Mr. W. Hubbard, of Langham; second, 2*l*., to Mrs. Ann Wright, of Burley.

To the owner of of the best Heifer Calf, under six months old at the time of showing, 2*l*., to Mrs. Jane Harris, of Langham; second, 1*l*., to Mr. Joseph Harris, of Langham.

Offered by Lord Aveland.

Long-woolled Fat Wether Sheep, a Silver Cup, value 10*l*., to Mr. C. J. Bradshaw; second, 5*l*. (offered by the Society), to the Most Noble the Marquis of Exeter.—Commended: Sir W. De Capell Brooke, of Geddington Grange.

Offered by the Society.

To the owner, being a tenant farmer, of the best Long-woolled Fat Wether Sheep, one year old, 7*l*., to Mr. C. J. Bradshaw; second, 4*l*., to Mr. E. Wortley, of Ridlington.

To the owner of the best Breeding Ewes, 5*l*., to Mr. C. J. Bradshaw; second, 3*l*., to Mr. R. L. Bradshaw, the Rookery, Tinwell.—Commended: The Hon. Colonel Lowther, of Barleythorpe.

Long-woolled Theaves, one year old, £4, to R. W. Baker-Esq.; second, £2, to the Hon. Col. Lowther.—Highly commended: Mr. C. J. Bradshaw.

Long-woolled Wether Lambs, £3, to Mr. C. J. Bradshaw; second, £2, to the Hon. Col. Lowther.

Long-woolled Ewe Lambs, £3, to Mr. C. J. Bradshaw; second, £2, to the Hon. Col. Lowther.

Pigs of any large breed, under 18 months old, £4, to Mr. W. Carver, of Ingarsby; second, £2, to Mr. W. Benskin, of Rearsby.—Commended: J. W. C. Ewart, Esq., of Ketton.

Pigs of any small breed, under 12 months old, £4, to Mr. W. Carver; second, £2, to Geo. Whichcote, Esq., of Osbournby.

Offered by the Earl of Gainsborough.

To the owner of the best Fat Pig, £2, to Mr. John Stimson, of Egleton.

Offered by the Society.

To the exhibiter of the best In-pigged or Suckling Sow or Yelt, £2, to Mr. E. Wortley.—Commended: Mr. Thomas Swingler.

Offered by the Marquis of Exeter.

To the owner of the best Half-bred four years old Hunting Mare or Gelding, £10, to Mr. J. Morris, the Grange, Oakham; second, £5 (by Gentlemen of the Cottesmore Hunt), to Mr. T. Shipman, Croxton Lodge.—Commended: Mr. J. Stokes, of Broughton, Sulvey.

Offered by his Grace the Duke of Rutland.

To the exhibitor of the best Beast, shown as extra stock, a silver medal, value £3, to Sir W. De Capell Brooke, Bart.

Offered by the Tradesmen of Oakham.

To the exhibitor of the best Sheep, shown as extra stock, a silver medal, value £3, to Mr. C. J. Bradshaw.—Highly commended: Mr. T. Swingler. Commended; The Hon. Colonel Lowther.

EXTRA STOCK.

G. Whichcote, Esq., of Osbournby, a Fat Pig: commended.

J. W. C. Ewart, Esq., of Ketton, a Calf; commended.

ROOTS AND VEGETABLES.

Offered by Viscount Campden.

For Swedish Turnips, cultivated on any system, £7, to Messrs. Paddy and Franks, of Wing; second, £3, to Mr. T. W. Fowler, of Exton.—Highly commended: Mr. J. G. Bosworth, and Mr. W. Hammond.

Offered by the Hon. Gerard James Noel, M.P.

For Swedish Turnips, a silver cup, value £10, to the Right Hon. the Earl of Gainsborough.—Commended: Messrs. J. and R. Painter, Mr. J. Christian, and Mr. C. J. Robinson.

Offered by the Tradesmen of Oakham.

For Swedish Turnips, £3, to Mr. J. C. Bradshaw, of Alstoe House, Burley-on-the-Hill.

Offered by the Society.

For Mangold Wurtzel, £2, to the Hon. Col. Lowther, of Barleythorpe.

Offered by the Hon. Roden Noel.

For Mangold Wurtzel, £3, to W. R. Morris, Esq., of North Luffenham.—Commended: Mr. C. Smith, Mr. J. G. Bosworth, R. W. Baker, Esq.—Highly commended: W. Fabling, Esq., Mr. W. H. Bullivant, Mr. E. Wortley.

Offered by the Society.

For Cabbages, £1, to R. W. Baker, Esq., Cottesmore.

Offered by the Tradesmen of Oakham.

For White Turnips, a silver cup, value £5, to Mr. T. Fryer, jun., of Preston.—Mr. J. Christian and Mr. J. Bosworth, commended.

The usual premiums were also awarded to labourers, &c.

THE DINNER,

which was provided by Mr. Barnett, of the Red Lion, took place shortly after three o'clock at the Agricultural Hall. There was a large attendance, the fine room being quite filled. The Right Hon. Sir John Trollope, Bart., M.P., presided with his wonted spirit and ability. On the Chairman's right were the Hon. G. J. Noel, M.P., the Hon. H. Noel, R. W. Baker, Esq., W. Baker, Esq., and R. Smith, Esq.; and on his left, the Hon. G. J. Heathcote, M.P., G. H. Finch, Esq., W. A. Pochin, Esq., and the Rev. T. Byers. The vice-chairmen were Mr. Berridge and Mr. Wortley. We also observed amongst those present the gentlemen undernamed: W. R. Morris, Esq., H. Samson, Esq., Thos. Syson, Esq., Wm. Fabling, Esq., Wm. Sharrad, Esq., B. Adams, Esq., &c., &c.

After the usual loyal toasts,

Mr. G. H. Finch gave the Members for the County.

The Hon. G. J. Noel returned thanks, and made a political speech of considerable length, in which the Chinese war and the question of peace or war with France was fully discussed. In reference to agriculture, the hon. member said he was not much of a farmer; he did not know much about agriculture; but it was said that "he who runs may read," and as he passed through this county year by year he was astonished at the great improvements continually going on in the cultivation of the soil. Science had been brought to bear upon agriculture; labour and capital had been expended upon it; and all, he hoped, with profit to those engaged in it. He would ask, had not this society something to do with this improvement? He maintained that it had; and for that reason he gave it his support.

The Hon. G. Heathcote followed. He was afraid that he could not congratulate his hearers upon a very abundant crop of corn, or very high prices; but if he could not congratulate them upon these matters, he could, at any rate, congratulate them upon one of the best shows ever held in the Riding School in that town. He believed there had never been a better show seen in connection with that society. The sheep were especially good. The attendance also was larger, he believed, than last year, when they were considered to have had a particularly large show. But whilst they had such able officers connected with this Society, he did not wonder at it flourishing; and when they saw the prizes for sheep won by residents, he must say that it did great credit to the county. He knew that politics, perhaps very properly, were forbidden on these occasions. But, as his hon. colleague had set the example, he (Mr. H.) ventured to say a few words upon political matters. The hon. gentleman here went largely into the Reform Bill question and the disputes of this country with China, America, &c., &c.

Mr. Baker then gave the health of the Chairman.

Sir John Trollope returned thanks. They had been told that he had always been an active supporter of this society: that was partly true, and he hoped to continue so to the end of his life, for though he was not altogether a Rutland man, yet, living in the next parish, he dwelt on its borders, and was proud to rank amongst its inhabitants some of its oldest, best, and most valued friends. Mr. Baker had carried back his recollection for a period of thirty years, during which both that gentleman and himself had been members of this society. But Mr. Baker had forgotten to tell them that the society was mainly originated by himself, and that but for his untiring exertions and support during that long period of years it might not have prospered so well, but might have shared the fate of many others. Amongst those present on that occasion, he (Sir John) observed an old friend from Langham (Mr. Sharrad), who had never missed an anniversary that he could remember.

Mr. Sharrad: Only one.

The Chairman continued: He was also glad to see that Mr. Robt. Smith, an early supporter of the society, once more appeared amongst them. Above all, he rejoiced in the great success achieved by Mr. Bradshaw, whose father was likewise present to witness the good fortune of his sons, who were following in his steps in regard to good husbandry and the production of the best class of animals. And he (Sir John) was not less proud that his own county of Lincoln came in for a small share of the prizes with animals that did no disgrace to their neighbours. In the few classes which Lincolnshire men had contended that day they had done themselves no small credit and honour. He alluded more particularly to Sir Thos. Whichcote and Mr. Lynn, of Stroxton. He (Sir John) assured the meeting that it gave him the greatest possible pleasure to accept the honour they had been kind enough to offer him on that occasion; for though, as he had said, he was not altogether a Rutland man, he had been a vice-president of the society a good many years, and he considered it the duty of the vice-presidents, in turn, to take the chair. They had got a young Vice-president amongst them that day (Mr. Finch). They had entered a very good colt in the race: he knew that gentleman was uncommon hard to beat across the country, and he thought he would take an equally prominent part under the green cloth of their festive board. It was to be hoped that he would turn out an excellent supporter of agriculture in all its branches, as his honoured and respected father had been before him. He (Sir John) should not wish to say one word in reference to those matters which had been touched upon by their excellent representatives in speeches of considerable ability. As he was out of his own constituency, he should not say a word upon politics or public matters; but simply observe that he and they should soon meet in a certain place, where he hoped all would work together for the good of the country at large.

The Chairman then gave "Success to the Rutland Agricultural Society," and in the course of an address of some length adverted to the application of science and skill to the cultivation of the soil. They could not control the elements or the seasons, but they could drain their land, keep it clean, and adopt those improvements to which their attention was directed by societies like this. The tenure of land was a subject which had often attracted his attention. Leases were almost unknown in that locality, and he did not think that even an agreement should be too strictly insisted upon. It was questionable whether it was wise to tie a man down too strictly to the four-course system. He would tell them why he thought there might be some change for the better in that respect. Looking at the roots exhibited that day, there was not much to be desired in the way of improvement. But throughout the country there had been a great failure in the crops of turnips, especially in the North of England and Scotland; and this had also been a good deal felt in the county of Lincoln. Now when land was scientifically farmed, why should a man be tied down to grow turnips every four years, when they might prove a failure? No doubt turnips were the most profitable crop for their sheep, but if they would not grow, why should not the man who farmed his land clean and well be allowed to adopt the six-course system? If a man liked to grow twitch instead of wheat, and docks instead of red-clover, he (Sir John Trollope) should say his calling was not to be a farmer; and that it would be better for him to try something else, in those trades and professions where mixtures were very much advised. This, he thought, was a matter worthy of consideration in farmers' clubs and agricultural associations. For his own part, he was of opinion that there should be great liberality in construing leases and agreements between landlords and tenants; and that trustworthy men ought not to be tied down too strictly by these parchments or papers.

Mr. Baker said, with regard to the hall in which they were assembled, he (Mr. Baker) might be permitted to state that £161 10s. 9d. had been expended in its improvement, and that the only debt standing against it was £3 10s. 9d. In 1846 there was a debt upon the building of about £400. A mortgage was then suggested, but he resisted it, and the amount was raised by subscription. Mr. Baker then made a few remarks upon the advisability of offering prizes for stacking and thatching, in regard to both of which, in the county of Rutland, system seemed to be altogether lost sight of.

The proceedings of a highly successful meeting were brought to a close shortly before nine o'clock.

THE IMPORTATION OF BUTTER AND ITS CHARACTER.

Butter, which forms so large an article of consumption, with us is, comparatively speaking, very little used in many of the Continental States. Beckman tells us that in Germany and among the ancients it was chiefly employed as an unguent, or for inunction at the baths, and as a medicine. It was scarcely ever mentioned as food; olive and other vegetable oils probably being those chiefly used, as they are still largely on the shores of the Mediterranean and most tropical countries. At the present day even butter is very little used for food, in Italy, Spain, Portugal, and the south of France; indeed dairy occupations do not find favour with the people.

The commercial value and importance of this dairy product is often underrated. A few facts in connection with the subject may serve to correct this mistake. The total production of butter in the United Kingdom has been variously computed. The most recent calculation, and that by a competent statist, Mr. Braithwaite Poole, in his "Statistics of British Commerce," estimates the production and consumption at over 160,000 tons per annum, worth at the general average of 10d. per lb., £13,328,000. But our home production appears to be insufficient for our consumption and export demands, since we import from the Continent from 20,000 to 25,000 tons, and ship from 5,000 to 6,000 tons per annum to various quarters. Some ten years ago we used to ship four times this amount; but the export trade has been taken into their own hands by the Continental merchants, owing to the facilities of direct shipment now offered.

The following return shows the yearly import of butter into this country since 1844:—

Years.	Cwts.	Years.	Cwts.
1844	185,511	1852	285,497
1845	253,723	1853	403,289
1846	257,385	1854	482,514
1847	314,125	1855	447,266
1848	294,427	1856	513,392
1849	281,969	1857	441,606
1850	330,579	1858	387,999
1851	353,718		

The proportionate sources of supply will be seen from the return for 1857; which shows that we received from—

	Cwts.
Denmark	3,809
Hanover	4,235
Hanse Towns	55,789
Holland	255,872
Belgium	62,288
France	26,290
Channel Islands	28,465
British North America	1,430
Other parts	3,428
	441,606

The computed net value of this quantity, at from £4 to £5 per cwt., is stated at £2,061,280; and the duty levied on it at 2s. 6d. per cwt. for the butter of British possessions, and 5s. for that from foreign countries, yielded £110,593 to the revenue. From 13,000 to 14,000 tons of Irish butter is imported annually into Liverpool, and about the same quantity into London.

From the following series of returns it will be seen that Hamburgh exports annually about 143,000 cwt. of butter; Holland, 32,000,000 lbs.; Belgium, 8,500,000 lbs.; and France about the same. The greater portion of the butter made in the dairies of Holstein and Schleswig is bought up by the Hamburgh merchants, though it is likewise sent in considerable quantities from Kiel and other ports to England, Copenhagen, and the West Indies. Lubeck imports about 700,000 lbs., and Bremen 3,000,000 lbs., of which one-third is re-exported. In Switzerland about 250,000 cwt. are made annually. Austria imports about 13,000 or 14,000 cwt.; Tuscany, 400,000 lbs.; Portugal, 2,000,000 lbs.; and Spain, 500,000 lbs. From Wallachia, 300 to 400 cwt. are shipped. The butter production of Finland is said to be over 2,000,000 stone yearly.

EXPORTS OF BUTTER FROM HAMBURGH.

	QUANTITY.	VALUE.
Year.	Centners or cwt.	Mks. Banco.
1850	107,767	3,757,210
1851	114,627	4,330,530
1852	97,720	3,760,890
1853	110,091	5,337,930
1854	129,771	6,574,624
1855	142,639	7,491,310

EXPORTS OF BUTTER FROM HOLLAND.

Year.	Ponds or kilog.
1850	12,016,261
1851	12,737,808
1852	12,125,662
1853	13,426,398
1854	14,435,365
1855	14,675,674

The kilogramme is about 2¼ lbs.

BUTTER EXPORTED FROM BELGIUM.

	QUANTITY.	VALUE.
Year.	Kilog.	Francs.
1850	1,781,295	2,671,942
1851	1,921,279	2,881,918
1852	2,218,887	3,550,220
1853	2,706,511	4,330,417
1854	3,913,071	7,043.528
1855	3,826,313	7,652,626

Of the foregoing quantities 600,000 to 700,000 kilogrammes are butter the produce of Holland and France.

BUTTER EXPORTED FROM FRANCE.

	QUANTITY.	VALUE.
Year.	Kilog.	Francs.
1851	2,553,825	3,638,244
1852	2,621,376	3,820,891
1853	4,344,472	6,379,052
1854	5,193,718	8,765,632
1855	3,900,870	9,259,196

The quantity of butter annually brought to the Halle of Paris averages 15,000,000 to 16,000,000 lbs.

In the United States the dairy produce is an important item, although the American shipment of butter is not large; and they are even importers on some occasions. The United States census of 1850 returned the amount of butter made annually in the entire Republic at 315,000,000 lbs., and this at 10d. per lb. gives a value of about £12,600,000. Indeed the value of the butter and cheese was about two-thirds that of the slaughtered animals, and one-half as much as the cotton crop, the great staple of the South. The American shipments of butter are from 2,000,000 to 3,000,000lbs. annually, of which the largest proportion goes to California and the West Indies, and some to China and Australia. But occasional imports are received from Canada, Holland, and France, for home consumption and export.

These facts and figures will, we think, be found interesting to all who deal in or eat butter. We desire also to impress upon all the importance of improving the quality of this article of food, in which the health and comfort of the consumer and the profit of the producer are so intimately concerned. When people come to know that rancid butter is as certainly poisonous as rancid tallow, they will be more cautious about eating it, and we trust about selling it too. Much has yet to be learned in this matter, both as to the manufacture, transport, and preservation of butter in a wholesome state.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

At a Monthly Council, held on Wednesday, Dec. 7, 1859, Lord WALSINGHAM (President) in the chair, present—Earl Powis, Lord Berners, Lord Feversham, Lord Leigh, Lord Tredegar, Sir J. V. Shelley, Bart., M.P., Sir William Miles, Bart., M.P., The Hon. W. G. Cavendish, M.P., Hon. Col. Hood, Hon. Leslie Melville, Mr. Dyke Acland, Mr. Amos, Mr. Raymond Barker, Mr. Barnett, Mr. Bramston, M.P., Mr. Barthropp, Mr. Wentworth Buller, M.P., Mr. Caldwell, Col. Challoner, Mr. Exall, Mr. Brandreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Holland, M.P., Mr. J. Howard, Mr. Wren Hoskyns, Mr. Hudson (of Castleacre), Mr. Jonas, Mr. Kinder, Mr. Lawes, Mr. Lawrence, Mr. Milward, Mr. Paget, M.P., Mr. Pain, Mr. Pope, Mr. Shuttleworth, Professor Simonds, Mr. Slaney, M.P., Mr. Robt. Smith, Mr. H. S. Thompson, M.P., Mr. Torr, Col. Towneley, Mr. G. Turner, Professor Voelcker, Mr. Jonas Webb, Mr. Burch Western, Mr. Henry Wilson, and Professor Wilson;

The following members were elected :—

Burn, Robert Scott, Stockport
Crawford, William, Lakelands, Cork
Dodson, Charles Edward, Littledale Hall, Lancaster
Eardley, Richard, Norton-in-Hales, Market Drayton
Garde, Thomas, Ballinacurra, Cork
Meade, William Richard, Ballymartle, Kinsale, Co. Cork.
Pimlet, Joshua, Norton-in-Hales, Market Drayton
Sankey, Robert, Canterbury
Smith, David, jun., Easton, Wickham Market
Whitmore, William, Wickham Market
Williams, Philip, Wednesbury Oak, Tipton

The usual monthly report of the Finance Committee was laid before the Council. From this it appeared that the present current cash balance in the hands of the Society's bankers amounted to 1,711*l*.

The balance-sheet of the Chester Meeting was laid before the Council, as prepared by the members of the late Finance Committee at the request of the Council.

The report of the Secretaryship Committee was laid before the Council, together with the names of the ten candidates the Committee considered the most eligible.

The Council having had an interview with each of these candidates proceeded to the election, which terminated in Mr. Henry Hall Dare being elected to the office of Secretary, subject to the necessary securities being given, his duties to commence on the 1st of January next.

The report of the Editorship Committee having been laid before the Council, it was resolved to appoint a Literary and Scientific Editor of the Society's Journal, at a salary of £500 per annum—such Editor's whole time to be at the disposal of the Society, and that advertisements be inserted in order to obtain applications for gentlemen desirous of becoming candidates for this office.

A vote of thanks was passed to Mr. H. S. Thompson, M.P., and the members of the Journal Committee.

A vote of thanks was passed to Mr. Brandreth Gibbs, the Hon. Sec. *pro tem.*

The report of the General Canterbury Committee having been laid before the Council, it was resolved to accept the offer made by the Local Committee at Canterbury to give prizes for Hops and Wool, subject to conditions to be determined upon by the Council.

The report of the Live Stock Prizes Committee having been laid before the Council, it was resolved to add classes for Heifer Calves in the Shorthorn, Hereford, and Devon divisions of Cattle; also classes for the Shropshire breed of Sheep, and for the Kentish or Romney Marsh breed of Sheep; and to classify Pigs as follows, viz., Pigs of a large breed of any colour, Pigs of a small white breed, Pigs of a small black breed, and Pigs not eligible for the preceding classes.

The report of the Implement Committee having been laid before the Council, it was resolved to offer prizes for the class of Applications of Steam Power to the Cultivation of the Soil, and for the classes of Thrashing-Machines, Chaff-Cutters, Mills, Crushers, Oilcake-Breakers, Bone-Mills, Turnip-Cutters and Pulpers, Hand-tools used in Hop-grounds, and Hand-tillage, Field-gates, &c., the details of which will appear in the Prize-sheets that will be issued for the Canterbury Meeting.

The report of the House Committee was received and adopted.

On the motion of Mr. Brandreth, the resolution of which Lord Portman had given notice was carried, viz.: to appoint a Professional Accountant to examine the Society's accounts from time to time, under the direction of the Finance Committee.

A communication was read from Mr. Manning relative to the deed of assignment made by the late Mr. Hudson, and the Finance Committee and Honorary Secretary were authorized how to act relative thereto.

Mr. Lawrence presented a copy of his "Handy Book for Young Farmers." The Council ordered thanks to be returned for this and other presents.

The HALF-YEARLY MEETING of this Society was held on Friday, Dec. 9, in Hanover-square. In the absence of the President, Lord Walsingham, the chair was taken by Colonel CHALLONER. Among those present were Lord Feversham, Lord Denman, Sir W. O. Pell, the Hon. Colonel Hood, Mr. Bramston, M.P., Mr. Ray-

mond Barker, Mr. Fisher Hobbs, Mr. H. Wilson, Mr. Brandreth, Mr. Pope, Mr. Brandreth Gibbs, Professor Simmonds, Mr. B. Western, Mr. J. Druce, Mr. H. Corbet, Mr. T. Duckham, M. Tréhonnais, Mr. H. Hall Dare (the new Secretary), &c., &c.

Mr. **Brandreth Gibbs**, who has for several months filled gratuitously the office of Secretary, read the following Report of the Council :—

REPORT OF THE COUNCIL.

The Society consists, at the present time, of
79 Life Governors,
128 Annual Governors,
933 Life Members,
4,082 Annual Members,
18 Honorary Members,
making a total of 5,240 Members, or an increase of 79 names since the last half-yearly meeting.

The funded property of the Society amounts to £10,000 Stock, standing in the names of the trustees in the New Three per Cents.

The Council regret to have to report the unfortunate circumstance that has taken place, and which led, first to the suspension, and subsequently to the dismissal, of the late Mr. James Hudson from the office of Secretary to the Society.

In the month of May last, it came to the knowledge of the Finance Committee that certain monies received by the Secretary on account of the Salisbury, Chester, and Warwick country meetings had not been paid by him to the Society's bankers.

They therefore immediately employed a professional accountant to investigate the accounts; and the result was reported to a Special Council called by the President for the purpose, on the 27th of May.

The Council having taken the matter into consideration, determined to suspend Mr. Hudson from the office of Secretary, and appointed a Special Committee, who were charged with fully investigating the exact state of the Secretary's accounts.

From the report of this Committee, it appeared that the accountant had discovered an amount due from Mr. Hudson, consisting chiefly of payments received by him from exhibitors of implements for shedding, for entrance fees on live stock and implements, fines, and small amounts, making a total of £1,933 8s. 3d. The different monies forming this amount had not been entered in his cash-book, or accounted for to the Finance Committee as received, and had not been paid into the bankers according to the bye-laws.

The Council therefore dismissed Mr. Hudson from the office of Secretary, and withheld the payment of the salary due to him, amounting to £161 19s. 9d.

Whilst legal advice was being taken as to the course which should be pursued in this very difficult matter, the death of Mr. Hudson occurred.

It appeared that, a short time before his decease, Mr. Hudson executed a deed of assignment, making over the whole of his effects for the benefit of his creditors; and under legal advice, the Council determined to come in as creditors under the deed in question, and authorized the Honorary Acting Secretary to sign it on behalf of the Society for the balance due, viz., £1,771 8s. 6d.

At present, it is impossible to ascertain definitely what dividend will be realized; but it is hoped that this large amount will be considerably reduced by it.

The total loss which the Society may have to sustain will be further lessened by the business of the Society having been carried on without a paid Secretary for the last seven months.

The Finance Committee who were acting at the time when Mr. Hudson's deficiency was discovered having tendered their resignation, in order that the future course of the Council might be left perfectly free, the Council have appointed a fresh Finance Committee, who will be charged with such reorganization of the accounts as may be deemed necessary.

The Council, however, have much pleasure in being able to report that, notwithstanding the funds having sustained a diminution by the large amount due from the late Secretary, not only have they found it unnecessary to touch the funded capital of the Society, but that its financial position is unusually satisfactory, the balance at the bankers on the 7th inst being £1,711, whilst the claims on the Society consist only of the ordinary current expenses.

After the suspension of Mr. Hudson, and again after his dismissal, and at the request of the Council, Mr. Brandreth Gibbs consented to undertake the office of Honorary Acting Secretary *pro tem.*, for which valuable assistance the Council desire to offer to him their most grateful acknowledgments.

The Council have come to the resolution of requiring the new Secretary to the Society to find approved security to the amount of £1,000; they further require that he shall pay all amounts received by him on account of the Society into the bankers forthwith; and they have laid down rules which, they trust, will render impossible a recurrence of any irregularity in the Society's business.

The Council have now elected Mr. Henry Hall Dare as Secretary, at a salary of £400 per annum, with residence, fire, and lighting; and they have every reason to hope, from the testimonials they have received, that he will discharge the duties of the office to the satisfaction of the Council and the Members at large.

It has also been determined to appoint a professional accountant, constantly to examine the Society's accounts, and report any irregularity to the Finance Committee, and also to suggest any improvements which may from time to time appear to be needed in the system of keeping the books.

The Council have determined to appoint a literary and scientific Editor of the Society's Journal, at a salary of £500 per annum; his duties to be performed under the general superintendence of the Journal Committee, and his whole time to be at the disposal of the Society.

The Council have recorded their high appreciation of the valuable services rendered by Mr. H. S. Thompson, M.P., and the other members of the Journal Committee, in conducting the Journal up to the present time.

The Warwick meeting was in every way eminently successful, and the number of visitors who thronged the show yard gave evident proof that the interest taken in the Society's country meetings remains unabated, whilst the entries of live stock and implements were unusually large; indeed, the enormous display of the latter appears a satisfactory indication that the present quadrennial classification of implements for trial and prizes, in no way interfered with the variety and general excellence of the exhibition as a whole.

The Mayor and Corporation, aided by a local committee, acting under their authority, rendered every assistance in carrying out all the arrangements that were necessary to be made in the locality. The competition for the local prizes for cattle, horses, sheep, pigs, cheese, wool, and farm-gates tended considerably to increase the interest of the meeting.

The Council have also to acknowledge the courtesy of the County Magistrates, in giving the use of the Judges' lodgings for the accommodation of the Stewards of the Society during the period they were at Warwick.

The arrangements that were decided on for the supply of refreshments in the show yard were a great improvement on former years.

The Council have fixed that the Canterbury Meeting shall take place in the week commencing Monday the 9th July next.

The Council have determined on the following arrangements for the Meeting :—

That the Live Stock shall all be in the yard the afternoon of Saturday, the 7th of July, which will allow of their recovering from the fatigue of the journey to the Show, previous to the Judges commencing their inspection on the Monday morning following. That the exhibition shall close on the Thursday evening, thus enabling exhibitors' servants and animals to return home without breaking into another week.

It has been determined to add to the Prize List a Class for Heifer Calves in the Shorthorn, Hereford, and Devon divisions; also to form separate divisions for the Shropshire breed of Sheep, and the Kentish or Romney Marsh breed of Sheep; and to classify Pigs as follows, viz.: Large breed of any colour; Small white; Small black; and Pigs not eligible for the preceding classes.

The schedule of Prizes for Implements and Machinery for

1860, according to the quadrennial system which came into operation last year, will contain Classes for Thrashing Machines, Chaff-cutters, Mills, Crushers, Oilcake Breakers, Bone Mills, Turnip-cutters, &c.; and to these the Council have added additional Classes for the application of Steam-power to the Cultivation of the Soil, for Hand Tools used in Hop Grounds and Land Tillage, and for Field Gates.

The Local Committee at Canterbury having expressed their wish to offer certain Local Prizes, the Council have determined to accept those for Hops and Wool, to be competed for under such conditions as the Council may determine.

The following schedule of prizes for essays and reports to be sent to the Secretary by the 1st March next, has been adopted:

I. AGRICULTURE OF BERKSHIRE.

Fifty sovereigns for the best report on the agriculture of Berkshire.

II. APPLICATION OF MANURE.

Twenty sovereigns for an approved Essay on the best period of the rotation, and the best time of year for applying the manure of the farm.

III. INFLUENCE OF PRICES ON FARM MANAGEMENT.

Ten sovereigns for the best Essay on the alterations rendered advisable in the management of land of different qualities, by low prices of grain and high prices of meat.

IV. LATE IMPROVEMENTS IN DAIRY PRACTICE.

Ten sovereigns for the best Essay on recent improvements in dairy practice.

V. THE PROPER OFFICE OF STRAW ON A FARM.

Ten sovereigns for the best Essay on the proper office of straw on the farm.

VI. FARM CAPITAL.

Ten sovereigns for the best Essay on the amount of capital required for the profitable occupation of a farm.

VII. SEED BED FOR AGRICULTURAL CROPS.

Ten sovereigns for the best Essay on the conditions of seed-bed best suited to the various agricultural crops.

VIII. ADULTERATION OF SEEDS.

Ten sovereigns for the best Essay on the adulteration of agricultural seeds.

IX. ANY OTHER AGRICULTURAL SUBJECT.

Ten sovereigns for the best Essay on any other agricultural subject.

A reprint has been made of Dr. Lang's Prize Essay on the potato. This can now be purchased at a reduced rate.

The society have from time to time been favoured, by order of the Secretary of State for Foreign Affairs, with copies of despatches received by Her Majesty's Government relative to guano and mineral deposits. Extracts from these communications have appeared in the published reports of the Council meetings, before which they were laid.

The Council have the satisfaction of recording their belief that the society is steadily progressing, and that by adopting such improvements in its proceedings as experience may from time to time show to be necessary, it will continue to maintain its important position in promoting the advancement of scientific and practical agriculture. By order of the Council,

B. T. BRANDRETH GIBBS, Hon. Secretary.

Mr. H. **CORBET** not being a member of the Council, rose to move the adoption of the report which had just been read, but he was sorry that that duty had not fallen into the hands of some one better fitted to perform it. He considered the report the most important one, on the whole, that had ever been presented to the Society. It went far beyond the usual Royal Speech kind of model, which said a great deal and meant very little. There was a great deal of information in this which the general body of members had been waiting for very anxiously. As regarded one very important feature, the question would naturally arise in the mind of every member about to read the report, whether there would be sufficient security in future for the safety of the money which passed through the hands of the Society and its officers? Whether it originated with the Auditors, with the Finance Committee, or with the Council generally, he was sure it would be satisfactory to all to find that henceforth the services of a professional accountant were to be engaged. Perhaps it was desirable that he should thus refer to the most unpleasant subject before them first of all. With regard to the rest of the report, he would observe, that it contained information which would be gratefully received, especially in reference to certain alterations and additions to the business of the Show week, about which there had been a good deal of conversation in the yard and elsewhere. He could not refrain from saying one or two words in reference to the office of Secretary. By the discharge of the duties of that post gratuitously for several months past, Mr. Gibbs had, to a considerable extent, diminished the loss previously occasioned; and he was sure he only echoed the feeling of the members generally, when he said that the Society was very deeply indebted to that gentleman for his services (cheers). He would suggest that the new Secretary might do well to take a hint or two from that wonderful "organ of order" which, spoken to at the recent dinner of the Smithfield Club, as so remarkably distinguishing Mr. Gibbs. During the present week he appeared to have almost achieved the impossible feat attributed to a celebrated Irish bird, of being in two places at one and the same time, having attended almost simultaneously to his ordinary duties as Honorary Secretary of the Smithfield Club, and to his extraordinary duties as temporary Secretary of the Royal Agricultural Society (cheers).

Mr. **JOSEPH DRUCE** seconded the motion, which was carried unanimously.

Mr. **RAYMOND BARKER**, Chairman of the Finance Committee, presented the balance sheet, signed by the auditors, which was as follows:

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Half-Yearly Account, extending from the 1st of January, to the 30th of June, 1859.

RECEIPTS.

	£	s.	d.
Balance in the hands of the Bankers, Dec. 31, 1858	649	11	6
Petty Cash Balance in the hands of the Secretary, Dec. 31, 1858	33	15	5
Dividends on Stock	146	17	6
Governors' Annual Subscriptions	385	0	0
Members' Life-Compositions	233	0	0
Members' Annual Subscriptions	1790	2	0
Journal Receipts	193	7	2
Country-Meeting Receipts:—	2144	6	9
	£5576	0	4

PAYMENTS.

	£	s.	d.
Permanent Charges	171	17	6
Taxes and Rates	9	5	6
Establishment	493	5	10
Postage and Carriage	18	10	7
Advertisements	5	7	3
Journal Payments	996	8	10
Veterinary Grant	100	0	0
Chemical Grant	350	0	0
Country Meeting Payments:—			
Chester	235	18	11
Warwick	1074	0	8
Subscription (paid in error by Bankers) returned	14	5	0
Sundry items of Petty Cash	3	5	2
Petty Cash in hands of late Secretary not accounted for	49	8	5
Balance in the hands of the Bankers, June 30, 1859	2047	18	7
Petty-Cash Balance in hand, June 30, 1859	6	8	1
	£5576	0	4

(Signed) THOMAS RAYMOND BARKER, Chairman,
C. B. CHALLONER,
HENRY WILSON,
} Finance Committee.

Examined, audited, and found correct, this 2nd day of December, 1859.

(Signed) WILLIAM ASTBURY,
JOSEPH DRUCE,
} Auditors on the part of the Society.

Sir W. O. **Pell** said he had great pleasure in proposing that the thanks of the meeting be given to the auditors for the manner in which they had discharged their duties.

Lord **Denman** seconded the motion, which was put and carried unanimously.

Mr. J. **Druce** returned thanks for himself and his brother-auditors.

The **Chairman** remarked that the next business on the agenda was the appointment of auditors for the ensuing year.

Mr. B. **Gibbs** read a letter from Mr. R. Barker, nephew of Mr. Barker, who was the Chairman of the Finance Committee, to the effect that, having removed to a distance from London, he found it inconvenient to act as auditor, and that he hoped some one would be appointed in his place.

Col. **Hood** proposed that Mr. H. Corbet should be appointed to fill the vacancy occasioned by the retirement of Mr. Barker, expressing at the same time his belief that no one would perform the duries of an auditor more efficiently (Hear, hear).

Mr. **Fisher Hobbs**, in seconding the motion, said he was glad that the appointment of the auditors rested with the members generally, and as a member of the Finance Committee he hoped care would be taken in future that there should be no faults or defects like those which had occurred in former years. The auditors were not officers of the Council or of the Finance Committee, and the members of the Society should take care to appoint gentlemen who were fitted to perform the duties entrusted to them. There was in future to be additional aid in the person of a professional accountant; but it was necessary to have a check, not only on the Finance Committee, who could not always attend there, but also on the professional assistant, and therefore he repeated the auditors ought always to be carefully selected. He had great pleasure in seconding the nomination of Mr. Corbet, because having known him well for many years he felt certain that he would not affix his name to any accounts without feeling perfectly certain that they were correct.

The motion was carried unanimously.

Mr. **Corbet** said he felt very much obliged to the meeting for having done him the honour of electing him to fill the office of auditor. His nomination was proposed and seconded by two gentlemen who were, he believed, themselves members of the Finance Committee, and he could only assure those gentlemen that he would try to keep a very sharp eye on their proceedings (laughter).

Mr. R. **Barker**, Chairman of the Finance Committee, said he trusted that nothing that had been uttered on that occasion would be understood as reflecting on the manner in which the auditors had performed their duties hitherto. (Hear, hear.)

The two other auditors, Mr. Astbury and Mr. Druce, were-reelected.

The **Chairman** said the business of the agenda having terminated, he should be glad to know whether any gentleman had any question to put to him, or any suggestion to make that might be referred to the Council for consideration.

After the lapse of a short interval,

Mr. **Fisher Hobbs** said as it appeared that no other gentleman had anything to say, he wished to make a remark in reference to the holding of that meeting on Friday. He knew that a great many members were obliged to leave London on the previous day. More than this, the Smithfield Club had now determined to have its dinner on the Tuesday instead of the Wednesday, and many members of the Royal Agricultural Society were of opinion that it would be a great advantage if the half-yearly meeting were in future held on Thursday instead of Friday, and as that alteration could be made by a simple change in the bye-laws, he wished to state that it was his intention to bring the subject forward at the meeting in February next.

The **Chairman**, after expressing his regret at the absence of the President, said as it was customary for the person who filled the chair on occasions like that to make a few general remarks with regard to the position of the Society, he would himself do so before the meeting separated. Although they had had that year the most unfortunate thing that could possibly have happened—namely, a deficiency in the accounts of the secretary, who filled that office for nearly twenty years, yet he must say that as a society they were never before in so flourishing a condition as at that moment. For twenty years, or from the time of the Society's formation, they were never able to pay the expenses in the same year that they were incurred. This year they were enabled to pay every outstanding bill, including the account for the *Journal*; and at Christmas there would be a balance of from £800 to £1,000 in favour of the Society. That was a financial state of affairs which the Institution had never attained previously. It was a great satisfaction to the late Finance Committee that, notwithstanding the loss occasioned by the late Secretary, they could hand over to their successors such a large balance, and place them in a position which was very different from what their own had been. They had been obliged to retain cheques which were drawn, till the money had come in from the country; and it was not till the spring of the following year that the current year's expenses could be met. Under these circumstances, and having regard to the new blood in the Finance Committee, he felt sure that the financial statement of May next would be very satisfactory, and the statement of a year hence equally so. He must congratulate the members of the Society in general on the good which it had done and was doing. Every day the position which they held, not merely in England, Scotland, and Ireland, but in Europe generally, was improving. They had even ceased to be abused by the press. That abuse had given a little spur to the management, and had tended no doubt to set them right. A little *secousse* from the press now and then was very valuable (laughter). They were very much indebted to the gentlemen who had made strong comments on the Society, because their doing so had been the means of instilling increased activity into the Council, and furnishing that stimulus which was wholesome and necessary in the case of all societies. In conclusion, he would express a hope that, when they met in May next, the Society would be in as flourishing and satisfactory a condition as it was then (cheers).

Lord **Feversham** said it had been intimated by the chairman that the business of the meeting was now concluded; but there was one duty, and not merely a duty but a pleasure, which the meeting had yet to perform, namely, to offer their thanks to Col. Challoner for his kindness in taking the chair on that occasion, in the absence of their noble president, and also for the services which he had for a long time indeed, ever since its formation, rendered to the Society (cheers). They were aware that he was always at his post, and ever ready to contribute his aid, alike at the deliberations of the Council table and at the proceedings of the general meetings. On that occasion he had explained to them in a few words the position in which that Society then stood. They had had the gratification of learning that the Society was in a state of peculiar prosperity; and, lamenting as he did the loss which they had sustained this year, he rejoiced in common with others to find that, notwithstanding that loss, the institution was in a better position as regarded its finances than it had been at any former period of its history (cheers). The meeting held at Warwick last summer was very fully attended, and everything went off with the utmost possible *eclat.* They had reason also to anticipate a successful meeting next year at Canterbury. He was informed that the prize sheets for the stock and implements would be out much earlier than they had been heretofore, that whereas the issuing of them had been sometimes postponed till March, they would, probably, in this instance be within a week or two from that time in the hands of all the members of the Society, while everything else was also in a good state of preparation. He begged leave to add his congratulations on the election of the new secretary of the Society. They had every reason to hope that that gentleman would discharge the important duties which had devolved upon him with the utmost assiduity and diligence, and that with the experience which he had already gained as a man of business, his services would be found efficient and useful. It was also a satisfactory circumstance that they had that day appointed an auditor who meant to look sharp after the new Finance Committee, and see how the funds were administered. They had sometimes had a little discussion at the meetings in December on points of difference; but on that occasion everything had gone off harmoniously. No gentlemen had attended to criticise the proceedings of the Council, or to suggest alterations in the management. The Council always listened with attention and respect to any suggestions or proposals which were made, though they might not deem it expedient to adopt them, and they would continue to do so. It was once remarked that that Society should be made more like the Central Farmers' Club. He confessed he could not see what advantage there would be in adopting that suggestion. He believed the Central Farmers' Club to be a most useful institution: he had frequently read the reports of the discussions which took place at its meetings: he admitted that most useful practical information emanated from those meetings, and he would not undervalue for a moment their importance or the service they had rendered to the cause of agriculture. But he really could not see what advantage would arise from the two societies acting on precisely the same principles: he thought they should be distinct in their action, and concurrent in their operations; but at the same time, he thought it was by each pursuing the course which had been chalked out for it, each following the even tenor of its way, that the prosperity of agriculture would be most effectually promoted, and that through the independent agency and instrumentality of the two societies, which had been properly called national institutions, the agriculture of this country would be enabled to maintain that high position among the nations of the civilized world which it held at present (cheers). He now proposed a vote of thanks to Col. Challoner for the services which he had rendered to the Society that day and on other occasions.

Lord Denman seconded the motion, which was put by Lord Faversham, and carried unanimously.

The Chairman, in returning thanks, said, as long as he had health and strength his time and his services would always be at the disposal of the Society, and he should always feel happy to be associated with the farmers of England.

The meeting then separated.

THE SMITHFIELD SHOW WEEK.

When the Clockmaker wished to give his companion some notion of England's wealth, he took him down to Ascot in the days that people travelled by road, and not by rail. He bid him reckon up all the equipages he saw by the way, what they cost to begin with, to keep up, and so forth. Then he was to hasten back to town, and he would not miss one of them; it would be as full as ever. "A knowing old coon, bred and born in London, might see a difference, but you would'nt." Let us put the converse proposition, and rather fill the metropolis than empty it. Might we not be satisfied, for instance, with the influx of the Smithfield week, when it would not surely have required the experience of an old coon to tell there *was* a difference? Every thing proclaimed as clearly as could be that it was the Cattle Show Week, and that our country cousins were up. Hale, hearty, well-to-do gentlemen jostled you in the street. Much-hurrying Hansoms were incessantly delivering varmint-looking cargoes at Hatchett's, the Tavistock, or the York; while every omnibus that went within a mile of Portman-square sported a large wood-cut of the Durham Ox as an assurance to the unwary stranger of what they could do for him. Print-sellers re-dressed their windows with Derby cracks and farm-yard scenes; and the polite Mr. Green raised his price to a shilling a-piece for permission to hear a song and order a supper. Oxford-street was in a continual state of blockade, and the oyster-houses in the Haymarket delirious with business. The most punctilious of bagmen was well content to get a bed "out," and the smartest of barmaids never to go to bed at all. The invasion really seemed to have reached us at last, and rus-in-urbe became everywhere a phrase susceptible of the highest possible illustration.

It is rarely that the week has been so busy a one, or so important in its results. Indeed, never yet had so many weighty matters to be discussed, if not to be decided upon, within the same few days. Of course these did not all refer to the Smithfield Club itself, although the future success of the society may very much depend upon what was done here. Certainly the Show has never enjoyed more support than it does just at present. Never were the prize animals so much handled and admired, never were the implement avenues so thoroughly impassable, and never, was so much money taken. This applies equally to the shillings paid at the doors, and the business done in the yard. The manufacturers have seldom had a better week, while town and country butchers were brisker buyers than ever. Still the Show itself was, in its chief attractions, hardly up to the average of excellence. Neither of the three orthodox breeds of Shorthorn, Hereford, and Devon were so generally good as they have been. The quality of the Durhams was just saved by the presence of Colonel Towneley's magnificent heifer: two extraordinary oxen did much for the small entry of Herefords, while the Devons depended more than is usual with them on their numerical strength. In fact, the force of the exhibition centred on the sheep and pigs, and on the Leicesters perhaps more especially, For the first time since its establishment the two Birmingham Society's gold medal animals—the best ox and the best cow—are the best in London, and many other of the previous week's awards are also confirmed. This may in some measure be accounted for by Mr. Sanday having acted as a judge on both occasions, coupled with the merits of the Metropolitan meeting not being of quite so high an order as heretofore. There could hardly have been a question as to the place of Beauty's Butterfly, and had Mr. Shirley's steer not taken the medal, another Hereford would undoubtedly have done so. It was entirely between the young one and Mr. Heath's ox, while many Hereford breeders preferred the latter. He is clearly a grander beast, but considerably older and fresher. The steer did not show quite so well as he did in Bingley Hall, and no wonder either, considering the number of practical comments and compliments he has had within the last few days to submit to. Public opinion, however, still continued to pronounce him one of the best and sweetest animals ever seen, and for his age he will long rank as a wonder.

Naturally enough, after all the crowding and jostling they had to endure, visitors were perpetually asking what the Club intended to do? Even the ingenuity of Mr. Boulnois can go no further, and another removal is now definitely determined upon. The Committee appointed reported all in favour of Islington and a Building Company. The General Meeting, however, have amended this, and have given their representatives a roving commission for another six months to look about them. The choice just at present appears to rest between the site already recommended and Kensington Gore, the latter finding many friends during the week. Nothing can read more judicious than this extension of time, and nothing less called for than another step the Club has agreed to. In future the dinner of the Smithfield Club is to be on the Tuesday instead of the Wednesday; that is to say, it is to come in direct opposition with that of the Central Farmers' Club, which has been long held on the Tuesday. It is scarcely possible to imagine anything more inconvenient; as Lord Berners, Mr. Charles Stokes, Mr. Jonas Webb, Mr. Hudson, of Castleacre, Mr. Fisher Hobbs, Mr. Buckley, Mr. Charles Howard, Mr. Mechi, and other leading men are in the habit of attending both. The alteration, moreover, was determined on without any consultation whatever with the Committee of the other Club, who numbering, as they do, far more members, are by no means likely to give way. The Smithfield dinner of this year, notwithstanding the absence of the Duke of Richmond, and the change of quarters, was well supported. The general character of the company was very good, but the after-dinner business comparatively tame and common-place.

Amongst other matters associated with the proceedings of the Club, Mr. Valentine Barford brought on his motion as to the unfair trimming of sheep; but there were too many old sinners in the brown paper, curling irons, and hair oil trade, to admit of his doing much with it. As one Member of the Club asked, why should you not show your sheep as you do yourself, in his best coat? There certainly can be no reason against this; but the complaint is rather, that with this fine coat Squire Southdown will not be content with less than two or three pair of breeches, some of which he has worn about home all his lifetime! Then Mr. Torr, going out of office as a Steward, named Mr. Stokes as his successor; and when Mr. Stokes' turn comes, of course he will be duty bound to name Mr. Torr as *his* successor. And so the thing will go round in the same little family circle, while everybody is still wondering that the Club does not number more than some two or three hundred members!

Fortunately for the interests of agriculture, they are gradually getting beyond these limited views in Hanover-square, where, on the Friday, the fullest report the general members of the Royal Agricultural Society have ever yet been favoured with was read and received. It touches openly and honestly on the lamentable difficulties the Council has recently had to contend against, while it promises all due care and precaution for the future. The arrangements for the conduct of the *Journal*, as well as for the Canterbury Meeting, are given in detail; and, in fact, there does not appear to have been a point shirked. If we did protest, it would be against the mere line or two with which the extraordinary services so liberally and opportunely rendered by Mr. Brandreth Gibbs are passed over; but probably his own modesty may have something to do with this. Mr. Hall Dare now succeeds him in the management of the Society's affairs, on the strength, we believe, of an election as fairly made as possible. Of the ten gentlemen summoned before the meeting on Wednesday, Mr. Dare's only really formidable opponent was Mr. Halifax Wyatt; and so close did the contest become at last, that, in a council of forty-six, Mr. Dare numbered twenty-three supporters, and Mr. Wyatt twenty-two—the Chairman, of course, not voting. Mr. Hall Dare's experience hitherto has been rather in arts of war than those of peace, as he served through the whole of the Crimean campaigns, but with some useful practice as adjutant and paymaster to his regiment. He is of an Essex family, and his father at one time represented the county in Parliament. Of the ten left in, the names of only two of the candidates were at all known in the agricultural world, and these two had in succession to surrender.

Our different reports include that of the Royal Agricultural Society's half-yearly meeting on the Friday, that of the Council Meeting on the Wednesday; the Smithfield Club Dinner, the Farmers' Club Dinner, and the Meeting to establish Mr. Mechi's Agricultural College; as well as a very excellent paper on "The Forces of Agriculture," read by Mr. Morton, at the Society of Arts, and the monthly discussion of the Farmers' Club. The opening address here scarcely reached what was expected of so good a man as Mr. Nesbit, who from indisposition was prevented going into the important part of his subject; and the debate, turned simply on the uses of mangel wurzel. This is now the second time in succession that the Club has fallen below its accustomed strength, and to keep up its character the committee must look about them for the new year. The dinner, on the contrary, was one of the best served and best conducted of the week. It seems almost a pity that the magnates of Smithfield should in their omnipotence go to crush so agreeable a gathering.

The Royal Agricultural College—a bad title—was just saved from being an amateur performance by the presence of Mr. Jonas Webb, Mr. Crisp, Mr. Skelton, and one or two more. Altogether the opening was quite as good as could have been counted upon, considering how the majority of the more eminent farmers still hold back. Our Staff must tell the story out, and narrate how the Shorthorns handled, and the Devons looked; how the sheep were sheared, and the pigs fattened. The great opportunity was at the private view on the Monday evening, when the Bazaar was even more desolate than usual. Members would seem not to care about exercising their privilege at so unseasonable an hour. The Prince Consort, however, availed himself of the royal prerogative a few hours earlier, when he was conducted round the yard by Colonel Hood, Mr. Brandreth Gibbs, and Mr. Torr, the senior steward—not too soon, it is to be hoped, for the honours awaiting the famous white Windsors. It is only right to add that His Royal Highness expressed his high satisfaction at the courtesy with which he had been received by the officers of the yard.

Notwithstanding the additions and improvements that have from year to year been made in the Bazaar to accommodate the animals and machinery exhibited, experience only shows how wholly inadequate is the space allotted for either one or the other. In fact, the implements and machinery are so crowded as to render it impossible for visitors to get anything like a fair view. This is now the annual complaint; and many are the suggestions and schemes to remedy the evil. We rejoice to find that something is about to be done. The Smithfield Club must ere long shift its quarters, and various sites for the intended erection and accommodation are mooted—Islington and Kensington Gore being the favourite localities. The latter would, perhaps, be the more acceptable to the general visitor, especially as there will shortly be an extension of the railway termini to that point. Either, however, must be a move for the better.

Although the improvement in the various breeds of cattle has become general, still we do not produce individual specimens to exceed those of very early date. Take the celebrated Durham ox, for instance. He was calved in March, 1796; at six years old he was 5 ft. 6 in. high, 11 ft. from nose to tail setting-on; girth, 11 ft. 1 in.; his breast was 1 ft. 6 in. from the ground, and the width between the fore-legs 1 ft. 5 in.; his breadth across the back-shoulders squared 3 ft. 1 in., middle of back 3 ft. 1 in., across the hips 3 ft. 1in.; width of first rib 9¼ in., and his estimated weight was 171 stones, 14lbs. to the stone. And many similarly large animals were exhibited about the same time. Mr. Robertson's 4 yrs. 10 months old ox, in 1794, weighed 145 st. 3lb., tallow 24st. 7lb.; Lord Yarborough's ox, 1830-1-2, was 5 ft. 6 in. in height, 11 ft. 10 in. nose to setting-on of tail, 11 ft. 1 in. girth, 3 ft. 3 in. across the hips, shoulders, and middle of back. Mr. R. Collins' heifer was estimated to weigh 130 st. at 4 yrs. old; Mr. Charge's ox, 7 yrs. old, weighed 168 st. 10lb. Now, modern improvements in breeding do not exceed this, if they attain to it. We do not know an instance in which it has been attained, even taking brother Jonathan into account. Mr. Wortley's prize shorthorn ox, in 1857, only girted 9 ft., and his length from shoulder-point to setting-on of tail 6 ft. The large Devon ox shown by Mr. H. H. Balls girted 8 ft. 8 in., his length 5 ft. 4 in. Mr. Jno. Coates' Devon cow obtained the second prize; her girth was 7 ft. 3 in., length 5 ft. 2 in. Mr. Bodley's famous cow 7 ft. 6 in., length 5 ft. 3 in. Mr. W. Heath's Hereford second prize ox measured 9 ft. 2 in., length 6 ft. Earl Darnley's Hereford 8 ft. 9 in., length 5 ft. 4 in. Mr. Jno. Naylor's large cow, 5 yrs. 8 months, measured 8 ft. 6 in., length 5 ft. 6 in. Earl Spencer's shorthorn steer 8 ft. 8 in., length 5 ft. 5 in. Mr. Stratton's steer 8 ft. 4 in. girth, length 5 ft. 5 in. These and other admeasurements were all taken in 1857. Mr. Stratton's ox, in 1856, was 9 ft. 1 in. girth, Mr. Belt's ox 9ft. 1 in., Mr. Heath's Hereford 9 ft. 2 in., and Mr. Naylor's 8 ft. 7 in. At the present meeting we have taken the girth of the following animals, all of them of superb specimens of their respective breeds. Mr. Shirley's Hereford steer is 2 yrs. 6 months and 27 days old, his girth is 8 ft. 7 in.; the Marquis of Exeter's shorthorn ox, 3 yrs. 8 months, his girth is 9 ft. 3 in.; Mr. Noakes' shorthorn ox, 3 yrs. 10 months, is 9 ft. 1 in. in girth; Mr. Maxwell's shorthorn steer, 2 yrs. 10 months, is 8 ft. 1½ in. in his girth.

In the cows and heifers, Beauty's Butterfly, Colonel Towneley's heifer, girths 9ft. 1in.; Earl Howe's heifer, 4 yrs. 8 months, 8 ft. 8 in.; Mr. W. Heath's Hereford, 3 yrs. 10 months, 9 ft.; Lady Emily Foley's Hereford cow, 5 yrs. 11 months, 8 ft. 7 in.; Mr. Swingler's, 3 yrs. 8 months, 8 ft. 7 in.; Mr. R. Wortley's shorthorn, 4 yrs. 6 months, 9 ft. 6 in.; Mr. Frost's shorthorn, 2 yrs. 11½ months, 8 ft. 2 in. These dimensions, good as they are, do not denote any great advance in size and substance, the Colonel's heifer excepted; she fully comes up to, if she does not exceed, our highest admeasurements. Mr. Ambler's celebrated cow did not equal this girth; if we mistake not, her girth was under 9 ft. We would observe that the few animals we girted are all beautifully proportioned, and stand high in their respective classes. Many breeders are also the fatteners of their own animals. Other exhibitors look out for animals of the highest order, and get them up for our inspection. Thus we have the advantage of selections from the best herds, and the assurance of their being done the most justice to. One man breeds and feeds like Colonel Towneley, and another feeds only like Mr. Heath.

We, of course, give the palm to the breeder who brings his own animal to the highest perfection; but we consider the class of feeders who show us so many beautiful animals, and which might otherwise have been lost to our gaze, worthy of all praise. To go into the common market, and purchase animals of high order, requires no ordinary judgment; but specimens purchased in this way often carry off our first prizes. Mr. Clarke Hillyard's Devon, it will be remembered, did so. Mr. W. Heath's beautiful animals have often done so; while His Royal Highness the Prince Consort has produced some admirable specimens of various breeds, but this year we have one bred upon his Royal Highness's farms, and which deservedly takes a good place, *i. e.*, a second prize.

In passing through the various stock classes, we confess we were not greatly impressed with any extraordinary estimate of the show. It is good, but not superior to former years. We certainly except Colonel Towneley's heifer: we have never seen a better. She will, in future years, give a character to the Show of fifty-nine. Otherwise the generality of the animals in all the classes strike us as being good duplicates of former years, but nothing more. In our preceding remarks we have perhaps hinted that we are not progressing quite so fast as some are led to suppose; and that so much attention has been paid to symmetry and beauty, that the more profitable qualities of size and weight, or substance and lean flesh, have been too much overlooked. We commend this remark to our breeders of cattle particularly.

The following table shows the number of cattle exhibited in the respective years :—

	1855.	1856.	1857.	1858.	1859.
Devons	17	21	32	28	37
Herefords	20	21	36	26	18
Shorthorns.............	40	42	43	42	47
Irish, Scotch, Welsh....	16	13	—	—	—
Other cattle	—	—	57	12	—
Other pure breeds......	3	18	—	26	—
Cross breeds	7	12	8	23	17
Extra................	9	13	—	14	—
Sussex	—	—	—	—	15
Norfolk	—	—	—	—	4
Longhorns.............	—	—	—	—	4
Scotch, horned	—	—	—	—	10
„ polled	—	—	—	—	13
Irish	—	—	—	—	1
Welsh	—	—	—	—	9
	112	140	176	171	175

It is not our intention to go through the respective classes in regular consecutive order, but rather to make a note or two of those which caught our attention most as we walked round.

In class 1 we never pass the Prince Consort's beasts without examination. His steer in this class is very creditable to the breeder, Mr. Halse; he is of excellent quality, and deep in frame, but across the rump he is too high, and his loin looks, consequently, low. Mr. Farthing's first prize steer is a capital type of the Devon breed: he possesses an astonishing loin, a good fore-quarter, great depth of frame, and is of excellent quality: but he has a slight deflex in the middle of his back. Mr. Dunning's second prize steer is a very handsome animal, with a deep cylindrical frame, and beautiful quality of flesh. Mr. Heath's third prize steer is a highly commendable animal, and well worthy his position. Mr. Farthing's No. 7 in this class is a good character. In class 2 Mr. Farquharson's steer received the first prize and silver medal: he is deep in chest, good girth, long and large in frame, but his hind points are not good. His Royal Highness the Prince Consort takes the second prize with the steer which took the first prize at Birmingham: he is a very neatly-formed animal, thick and full frame, not high standing, beautifully fed, flesh firm, and of exceedingly good quality. Mr. Heath again takes third prize with a very good Devon, having a deep full forequarter, but not evenly fed. Mr. Overman's steer is in excellent form, and full in frame.

The third class of Devon heifers exhibited several great beauties, as did also the fourth class—Devon cows. Mr. Heath's is a surprising animal of the breed, level and full-framed throughout. Mr. Cootes' cow was rather less firm in hand, but of nice frame. It is seldom that so many Devons of such excellence have been exhibited. They are a very interesting part of the show, and were greatly admired by dense crowds of visitors, who generally throng that avenue to inconvenience.

The Hereford classes are not numerously filled: we have never seen so small a show. There are, however, some splendid specimens of the breed. Mr. Heath's deep-framed ox is surpassingly good; a little more nobility of character and appearance would have carried the gold medal. He has capital fore-quarters; his breast, shoulder, and chine are first-rate in form; his flank, thigh, and underneath parts are extraordinarily good; his back, rumps, ribs, are all good, and well throughout; perhaps he is rather too short in frame and in his legs. Mr. R. Shirley's steer, which takes the gold medal, is quite a first-class animal; he is nearly a perfect type of the breed; he has beautiful looks and fine contour of head, and he possesses a deep level frame, of large development and cylindrical form; all his points are good, and in right keeping; his underneath parts are extraordinary; his purse is very large, but it is rather too forward, and his neck is too thin, otherwise he is nearly faultless at his age, only 2 years 6 months 27 days, and his girth 8 ft. 6-7 in. Mr. Naylor's cow and Lady Emily Foley's cow appear here as at Birmingham, and take the same positions (see our remarks of last week). Mr. Hill showed a very good heifer, the only one in the class, for which he was awarded the first prize.

The Shorthorns are great in number, and fair in character. They are a little in excess of former years as to number, and, by Colonel Towneley's heifer, also in excess as to quality and excellence. There are many splendid specimens of this valuable breed. It would occupy too much of our space to attempt to describe individual animals; but we cannot refrain from trying our pen upon Beauty's Butterfly, the most splendid representative of the Shorthorn cow we have ever seen; her looks are as placid and calm as can well be conceived; she has a handsome countenance, her head and face look rather fatty, but are finely formed; she has fine waxy, nicely turned horns; altogether it is "a lovely head;" her neck is full and is gracefully set to her head, shoulders, and chest, forming one of the finest fronts ever seen in any of her kind; her breast end is prominent, broad, and full, her shoulders well thrown out, her chine is very broad, and the rotundity and equability of her immense girth is astonishingly even and great, measuring 9 ft. 1 in.—in fact her frame is a very large and perfect cylinder in form, and of great length; her depth is wonderful, and the even level firmness of her sides, without protuberance in any part, is excedingly good; her hips lie very wide, and are most evenly fed, without damaging her shape in the least; her back is of extraordinary width, and is a perfect level; her underneath parts are all in equal proportion, and add to her beauty. The only slight imperfection we can discover yet is in her somewhat short rump and tut; and possibly her thighs and twist are scarcely full enough to her other immense proportions. She is a beautiful white without a speck. Her touch or hand is all that can be desired to enhance her quality. As we intimated last week, she returns to Towneley.

The classes of this breed are all well-sustained. We have many superior cows and heifers, but none to approach the favourite Beauty's Butterfly. Mr. Aldworth's is an exceedingly good heifer, as is that shown by Sir Thomas Whichcote, and another shown by Mr. Griffen. In the cow class Colonel Towneley is again triumphant, with a magnificent cow, which also is to return home, although whether for more feeding or breeding is not known. Mr. R. Stratton shows an extraordinary animal in this class, as does Mr. R. L. Bradshaw. Lord Howe has also a beautiful heifer in the extra-stock.

The classes of Shorthorn steers and oxen are always interesting. The Marquis of Exeter takes the front rank, with a most noble ox—so good and great, that, did time and limit permit, we should like to stay and portray him; it suffices for this time to say that he is a splendid specimen of his kind, and does honour to his classes, and is a redeeming point in the show. Mr. Swingler's ox is a good type, but his growth is not great; his general proportions are fair and good. Mr. Driffield's ox deserves especial notice, but we must pass on. There are several animals in this class highly worthy of notice. Mr. Wortley's ox has the largest girth of any in the yard, 9 ft. 6 in. Mr. Noakes' ox girths well, and is in good form and character. Mr. Cowley's is a capital beast, and Mr. Hewer's very heavy and well fed.

We are decided advocates for the breeds attaining to the earliest maturity, provided it is not attained at too great a cost. Shorthorn steers are not only rapid growers, but they continue their growth a long time. This militates against early maturity; and the question arises as to the profitable growth of the animal. Shall he be forced unnaturally? or shall he be left to grow and thrive upon common ordinary food? This is another of those queries that deserves almost equal consideration with that relative to aiming more at symmetry and beauty in breeding, rather than at size and lean flesh. The young Shorthorn steer can be as readily forced into premature ripeness as those of other breeds, and in this class we have some notable examples of it. Mr. Frost's 2 years 11 months and 2 weeks old steer has astonishing size and proportions; his girth is 8 ft. 2 in. He has attained to a very heavy weight at an early age. Mr. Maxwell's at 2 yrs. 10 months, is a still heavier steer; he is not so evenly fed, but has a deep, long frame, and capital rump-thighs, and hind-quarter good. Mr. John Overman's steer is another specimen of early ripeness, and stands in good competition with the above. This is a good class.

The Sussex oxen were shown in better character and numbers than usual. The ox exhibited by Mr. Shoosmith is a fine animal, and well formed; and Mr. Montefiore's ox is of good character and frame throughout.

Mr. Child's heifer has a very good and compact frame, and Lord Leaconfield's cow is a good type of a Sussex cow. Why is this breed perpetuated? They are capable of improvement by judicious crossing, no doubt; they are certainly not so good in general characteristics as either Herefords or Shorthorns, nor, we imagine, so profitable. The Norfolk and Suffolk classes are poorly represented. They consist of only four animals, all, however, fair of the kind. We think this breed might give place to a better, as did the Norfolk breed of sheep.

The Long-horned classes have only four entries from three exhibitors. We have seen better specimens of the breed. These, however, are creditable animals. The Scotch horned steers or oxen do not show largely, only ten animals being exhibited; but they are of a very superior order. Viscount Boyne's 4 yrs. 5 months old West Highlander is a splendid "Scot," having a deep, heavily-loaded frame of very superior quality. Mr. B. Troughton's is very nearly equal to him. Lord Middleton's is a good Scotch ox. There was only one heifer, a fair, useful animal enough. The Scotch Polled classes were in rather better representation. Mr. M'Combie takes the first prize with a remarkably large and excellent "Polled Scot." He took the first prize at Birmingham, and the gold medal at Aberdeen —a character good enough. Mr. Jas. Stuart's is a superior animal—a good type of the breed. The Polled Heifer class was small in number, but select and good. Earl Darnley showed the only Irish animal in the yard, for which he was awarded the first prize in the heifer class. The Welsh breeds are in good character, but few; Colonel Pennant's is a capital runt, as are Mr. Bennett's steers and heifers. The Cross-breeds are well-contested classes, and possess some highly useful animals in them. The Extra-stock classes are closely contested, and, as usual, we find some exceedingly good animals here. Earl Howe's heifer we have already named. The Marquis of Exeter shows a very deep-framed ox upon short legs.

SHEEP.

These classes are unusually full, and the specimens of their respective breeds are as good as usual. The annexed table will show their increase. In the sheep classes we find the numbers of sheep in pens to stand respectively:

	1856.	1857.	1858.
Leicesters and long-wools	40	35	37
Short-wools	38	62	60
Cross-breeds	18	32	32
	96	129	129

	1859.
Leicesters and long-wools	66 in pens of three
Extra stock	21 single
Cross-breeds	48 in pens of three
Extra stock	10 single
Short-wools	114 in pens
Extra stock	30
	289

The Long-wools so called are in the greatest excess, consisting of 87 specimens of these breeds, which here include Leicesters, Cotswolds, Kents, Lincolns, &c.—any breed, in fact, not being Short-wools. We cannot enumerate the many prize-worthy animals exhibited, but must pass rapidly on. Mr. Jordan's prize Leicesters are handsome, large, excessively fat, and in good form, with a good quantity of fine wool. Mr. Newman's lot are smaller, and the wool is a straight staple; they have nice frames. Mr. Bradshaw's are in exceedingly good type, as large Leicesters their quality excellent. Sir W. de Brook's lot are more like Long-wools than Leicesters. Mr. Armstrong's improved Leicesters show speckled faces, loose in quality, and long straight wool; no improvement. Mr. Twitchell's new Leicesters are large in character, with a straight staple. Mr. Foljambe's, in the next class, do in reality show as true Leicesters in form and character; they are very pretty, and of most superior quality. The lot of Lord Berners' are much larger, of great length, and not firm mutton. Mr. Bourt's lot are of good size, fair frames, but defective legs of mutton. Mr. Bradshaw's lot are very good, and of larger size. In the next class the Leicesters are shut out; but it is not well filled. Mr. Davis' lot are good; they have very compact frames, broad and full, with good looks. Mr. Tombs' lot are very useful, and have good skins. Mr. Mills' lot do not match in skin, and the thighs are defective. In the extra-stock class, Mr. Jordan shows a very good and heavy long-woolled wether sheep, his frame long, proportionate, and full, with a good fleece. This class is well filled with good animals. In the extra ewe class Mr. Jordan again exhibits a most admirable ewe, with broad back and rump. Lord Berners also shows a useful ewe, and very pretty.

The cross-bred classes are capitally filled, and with admirable specimens of the various crosses. Mr. George Hines takes first prize in these classes for his Down and Leicester cross; they are large, and have beautiful backs and fine full frames. Mr. G. Wallis shows some exceedingly large frames; they appear to be decidedly more Cotswold than Down. Mr. Hobbs' lot are very useful sheep. Mr. Walbey's lot, Down and Leicesters, do not shine as a cross—long and leggy. Mr. Twitchell's again are very good; they are called Oxfordshire Downs; and Mr. C. Howard's Oxfordshire Downs are of very good character. Mr. John Overman's are Southdown and Leicesters; these are splendid sheep, capital plaits, backs, and rumps. Mr. Tombs' lot we could not make out; they are said to be from half-bred Down and Cotswold ewes. We cannot make out all these crosses; some may be good, but others, we are persuaded, are not so. Crossing breeds requires correct judgment. Mr. Hine is again successful in the 34 classes, light weights. Mr. Overman's lot were exceedingly good, but, we presume, too heavy. The Extra-stock Cross-breed Class.—Mr. Wallis shows a good Cotswold and Oxford Down ewe (Silver Medal). Several other good animals are shown. The sorts vary much: 1st, Cotswold and Hampshire Down; 2nd, Cotswold and Oxfordshire Down; 3rd, the same; 4th, Cross-bred; 5th, Oxfordshire Down (this has a broad fine frame); 6th, the same; 7th, Down and Leicester; 8th and 9th, the same; 10th, Southdown and Leicester; 11th, Southdown and Cotswold. This constitutes the extra cross-bred classes. We name these crosses to show our readers what our breeders are attempting. It is remarkable what splendid specimens they produce, particularly to the unpractised eye. We hope great things from their endeavours; but the exhibition of this year does not satisfy us—brought up too, as they are, to such admirable perfection by the shepherd's shears and "Rowland's Macassar"—or rather, wax and hog's lard. It is shameful thus to impose upon the unwary.

We now come to the short-woolled breeds. These are always an important department of the show, and this year they will be found to be greatly in excess of former years, amounting to no less than 144 individual specimens of the many subdivisions into which short-woolled sheep are now divided. We have pure downs, Sussex downs, Oxfordshire downs, Hampshire downs, improved Hampshire downs, Shropshire Downs, West Country downs: seven differing varieties capable of competition in the three first classes—Nos. 35, 36, and

37 of the exhibition. The classes are for fat wether sheep of any short-woolled breed, 1 year old (under 22 months), without restrictions as to feeding pens of three. In the first of these classes Mr. Rigden's beautiful wethers take the first prize and gold medal, certainly one of the handsomest and most complete pens of pure downs ever exhibited. They are of good size, have very handsome head and countenances, truly symmetrical in frame, fine broad level backs and fat, capital docks and legs of mutton, broad chines, full breasts and plaits, rather short full necks, but well set to shoulder, ribs and hips well together. In fact they are a lot as compact in frame and as complete in form and beauty as can well be desired—perfect models of pure downs and of the very best quality of mutton; with wool in good quantity and fine quality. The second prize was awarded to the Duke of Richmond, for a pen of very handsome and beautifully-formed sheep; they are quite in character with all we recollect of the Duke's flock—the same lengthy frame, of superior contour; the very same calm, placid, but lively-looking countenances; the graceful, lengthy, but full neck; the wide, cylindrical frame of perfect symmetry; the fine height and lightness of offal; the like firm and flexible touch, denoting exceeding good quality of meat; the wide level backs, good rumps and loins—detracting possibly a little from their shoulders and girth; the wool exceedingly fine and good in texture. The third prize was awarded to the Earl of Leicester. These possess good looks beautiful frames, and are very compact and beautifully got up, and the wool denotes a good fleece and excellent quality of mutton. Lord Walsingham's lot are also good; they have large and well thrown out frames, but are not quite so fine and symmetrical as the above; they are much heavier, both, in frame and fleece, with both of very superior quality. They struck us as standing rather low: their great breadth might drown the height to our view; in weight and substance we thought they exceeded the others in the class. The Earl of Chichester shewed a pen of great beauty and excellent proportions. This is a first-rate class.

In class 36, each sheep not to exceed 200 lbs. in live weight, the first prize goes also to Mr. Rigden, for a pen the fac-simile of those named above. The second, to the Earl of Leicester, with the same contour of frame and beauty as those just named. The Duke of Richmond's is a splendid lot, but too heavy for competition. The well-known old shepherd confessed he could not get *one* "down to the weight." The Earl of Chichester's were likewise too heavy, they were quite in character with those already instanced. Lord Walsingham's lot are exceedingly good, but not quite compact enough for the first place; still they are a very profitable pen. Mr. Scott Hayward's are very handsome, but rather too small. There are several other lots worth very honourable mention.

In the 37th class, for fat wether sheep of any short-woolled breed 2 years old (above 22 and under 34 months), without restrictions as to feeding in pens of three, the Duke of Richmond takes the first prize. These possess the same elongated frames, but very good and compact, not too long—it is their character of frame. They have exceedingly good backs, good chines, loins, rumps, and legs of mutton, heavy in weight, excellent in quality, and thorough-bred in look. Sir R. G. Throckmorton takes a second prize with a very complete lot of good Sussex Downs. Lord Walsingham takes the third prize with a lot of more frame and substance and capital fleeces. Mr. John Overman shows a very useful lot, not so handsome as the Duke's; but they have deeper and heavier frames, but not so long. The Earl of Radnor's lot possess great length, depth, and substance.

The next classes are those of fat wether sheep of any short-woolled breed (not South Downs), one year old (under 22 months), without restrictions as to feeding. Mr. Canning takes the first prize with a very fine pen of Hampshire Down sheep: they are very large, well-formed, and excellent in quality, and of tremendous size for their age. So are Mr. W. King's, which take the second prize: their chines are of amazing breadth, and altogether a good form, with much wool: they are called West-country Downs. Mr. Stephen King takes the third prize with a pen of the same breed: they have uncommonly broad backs, long frames; their heads and necks, like others of the breed, are by no means handsome. Mr. Holland's Shropshires show well, but not in perfect form; a little more depth of chest and fulness of fore-quarter is wanted here, as in all the breed. This is the only lot shown of Shropshires, which rather detracts from the boasted excellence of the breed. Why not show in greater numbers, and prove their position. In the extra stock short-woolled wether and ewe classes the Duke of Richmond takes the silver medal in the wether class, with a prettily-formed sheep, rather defective in the shoulder, this being too low. Mr. Kent's wether has a good frame, and shows well. Mr. W. King shows a fine sheep, a West-country Down. The Earl of Radnor and Mr. Scott Hayward also show nice Downs. In the ewe class Lord Walsingham takes the medal with a very superior one: she has a long well-formed frame, a beautiful fat back, and level; fine plaits; her thighs and underneath part good. Mr. Rigden has a beautiful ewe with a deep, broad and well-formed frame. Mr. Scott Hayward again in this class enters a ewe of much beauty and excellent quality. Sir R. G. Throckmorton's ewe is very pretty, and in good form.

In taking our leave of these short-woolled classes we cannot, in justice to the public, omit to notice the extraordinary and unblushing way in which very many of them are shorn into shape according to the taste of the exhibitor or his shepherd. Some of them are so cleverly done as even to deceive the very judges themselves. For our part, we should discard every animal that was unfairly shorn into form. We are aware what a poor exhibition we should have left; but it is a positive insult to a good judge to show him a sheep so distorted. He has to examine him very accurately to detect all his faults, covered as they are in some parts by several inches' length of wool, and it is a regular Barnum imposition upon the casual visitor and the general public, who cannot afford time for close inspection. We would insist upon the animals being shown as naturally as possible. What an extraordinary deterioration would manifest itself in many of the short-wools, and not a little in the long-wools! As it now is, every pen appears as nearly perfect in form as may be, and it is only on close examination that judges can detect the rank imposition practised. It is now merely animals that are so wofully bad in the heads, necks, and legs, that cannot be brought up to the *standard of excellence* in appearance which all seek after and so few find.

PIGS.

In the pig classes, we find in pens of three:

1856.	1857.	1858.	1859.
Pens.	Pens.	Pens.	Pens.
38	54	57	33
			(or 99 specimens.)

Extra 18 pens, *i. e.*, 51 specimens.

These classes are well filled, and certainly do not denote any declension in the breed of pigs. We still see the same names over the different pens, with here and there a fresh exhibitor, but they are few: His Royal Highness the Prince Consort takes this year the lead of all competitors, and has the gold medal awarded to him as the exhibitor of the best pen of pigs in the yard. His Royal Highness is also the breeder of them, which stamps them with additional honour. We have the well-known names of Crisp, Morland, Barber, Coates, Druce, Barthropp, together with Sir John Cathcart, Sir R. G. Throckmorton, Lord Berners, Mr. Wilson, C. Barnett, Marquis of Downshire, old exhibitors.

In Class 39, pigs of any breed, not exceeding four months old (pens of three), Mr. G. B. Morland takes the first prize with an exceedingly fine pen, having attained astonishing weights at the early age of three months twenty-four days. They are marvellously good in form, size, quality, and beauty. Mr. W. M. Barber takes second prize with a pen of the same age. These possess beautiful frames, broad chines and backs, and are of deep form. His Royal Highness's pen are a very pretty lot, and so are Sir John Cathcart's.

In Class 40, pigs of any breed, above four and not exceeding eight months old, Mr. Morland again takes first place. They are in full character of his breed, which is somewhat peculiar. We should say they are between the large and small breeds, so called; they are neither delicate nor coarse, large nor small, but possess exceedingly well-formed frames of great beauty, and good weight and quality. The colour is dark and white—not quite black and white; hair rather long, but fine and thin set; face fair length, ears rather inclined to droop, but small and thin. They carry a heavy load of good flesh of beautiful quality, frame of a moderate size and proportions. Mr. Crisp takes second prize. His breed stands second to none in beauty, fineness of frame and form, and the beautiful fineness of meat. They are of the small breed, so called, but are large in size, with amazingly deep, heavy-loaded frames. His Royal Highness's lot are splendid fellows, very full chines and broad backs, and deep frames; a thin-haired, white variety of the small breed.

In Class 41, Mr. Beale takes first prize, with a very full-framed pen of extra weight, for the age, and good in quality. They are very cylindrical in form, large round bodies, not hanging so deep as many others. Mr. H. Wilson takes second prize. These are a beautiful pen of black pigs, with rather long thin hair, and their frames are almost perfect; very heavy, and excellent quality. Mr. Coates's pen is very compact, no hair; Mr. Barnett's exceeding good and heavy, the hair rather long. This is a good class.

Class 42, pens of three, above twelve months and under eighteen months. In this class His Royal Highness the Prince Consort stands at the head of the breeders of pigs as the exhibitor of the best lot in the yard, and these of his own breeding too. They are a very superior pen, nearly perfect in form and depth of frame; they have level broad chines, and backs level from head to tail, which stands well up, showing a good rump. They deservedly merit the highest distinction. Mr. E. Shepherd takes the second prize, with a pen of excellent Berkshires. They are a strong, useful, heavy pen, rather coarse in quality, but capital frames. Mr. Crisp's pen are exceedingly good, large full frames, broad and compact. Sir R. G. Throckmorton takes the silver medal in the Extra Pig Class, with a highly useful animal of great depth of frame and good quality of flesh. Mr. Crisp's pig in this class is unusually deep in frame and excellent in form. The pig shown by Mr. H. E. Surtees, age seventy-one months, is very large, almost a mountain of fat and grease; very heavy, and is in good form, back broad, and great length of frame; hair rather coarse. Mr. Druce shows a good pig; in fact, it is a very good class of large pigs, exceedingly well fed.

PRIZE LIST.

FAT CATTLE.

Judges.—Mr. J. Hole, Knowle House, Dunster.
Mr. W. Sanday, Holme Pierrepont, Nottingham.
Mr. W. Wetherell, Aldborough, Darlington.

DEVONS.

Steers, not exceeding 3 years old.

First prize of £25, and silver medal as breeder, Robert Farthing, North Petherton, Bridgewater. (Sold to Mr. Belcher, Reading).

Second of £10, John D. Dunning, Creech St. Michael, Taunton. (Sold to Mr. T. Down, Norland-road, Notting-hill).

Third of £5, William Heath, Ludham Hall, Norwich. (Sold to Mr. J. B. Munday, 114, Great Suffolk-street, Borough).

Commended—The Prince Consort. (Sold to Mr. Smith, Exeter).

Steers or Oxen, above 3 years old.

First prize of £25, J. J. Farquharson, Langton House, Blandford. Silver medal to breeder, James Quartly, Molland House, South Molton. (Sold to Mr. Munday, Andover.)

Second of £10, H. R. H. the Prince Consort, Windsor Castle. (Sold to Mr. Pawsey, Bath.)

Third of £5, William Heath, Ludham Hall. (Sold to Mr. T. H. Hatch, Croydon.)

Commended—H. Hine Ball, Haukridge, Taunton. (Sold to Mr. John Stone, Bridgwater).

Heifers, not exceeding 4 year old.

First prize of £15, Robert Farthing, North Petherton. Silver medal to breeder, Mrs. Sarah W. Farthing. (Sold to Mr. Freeman, 90, Bolsover-street, Portland-place).

Second of 5*l*., Edmund Coles, Stone Farm, Yeovil. (Sold to Mr. Hooke, Frederick-street, Hampstead-road.)

Cows, above 4 years old.

First prize of 20*l*., Wm. Heath, Ludham Hall. Silver medal to breeder, James Quartly, Molland.

Second of 10*l*. John Coate, Hammoon, Blandford. (Sold to Mr. Monckton, Wimborne.)

Third of 5*l*., George Turner, Barton, Exeter. (Sold to Mr. Fisher, Aylesbury.)

HEREFORDS.

Steers, not exceeding 3 years old.

First prize of 25*l*., Gold Medal as best ox or steer in any of the classes, and silver medal as breeder, Richard Shirley, Barcott Munslow, Shrewsbury. (Sold to Messrs. Davis, Black Bull, New Cattle Market.)

Second of 10*l*., Richard Hill, of Golding Hall, Shrewsbury.

Third of 5*l*., John Naylor, Leighton Hall, Welshpool.

Steers or Oxen, above 3 years old.

First prize of 25*l*., William Heath, Ludham Hall. Silver medal to breeder, the late Thomas Longmore. (Sold to Mr. Norris, Lamb Tavern, New Cattle Market.)

Second of 10*l*., Wm. Aldworth, Frilford, Abingdon. (Sold to Hedges and Wilkins, Oxford).

Third of 5*l*., John Naylor, Leighton. (Sold to Mr. Mason, Cutford-road, Ball's Pond).

Heifers, not exceeding 4 years old.

First prize of 15*l*., and silver medal as breeder, Richard Hill, Golding.

Second of 5*l*., *no competition.*

Cows, above 4 years old.

First prize of £20, and silver medal as breeder, John Naylor, Leighton Hall. (Sold to Mr. R. Jessop, of Oxford).

Second of £10, Lady Emily Foley, Stoke Edith Park, Ledbury ("Young Nutty" sold to Mr. R. Freeman, High-street, Notting-hill).

Third of £5, Captain Peploe, Garnstone, Hereford. (Sold to Mr. Stevens, Mile-end.)

SHORTHORNS.

Steers, not exceeding 3 years old.

First prize of £25, Edward Frost, West Wratting Hall, Linton, Cambridge. Silver medal to breeder, John Webb, Horseheath, Linton. (Sold to Beecham and Son, 17, Clare-street, Lincoln's-inn-fields).

Second of £10, George Maxwell, Kidbrooke Manor, Blackheath, Kent. (Sold to Mr. Glass, Lambeth.)

Third of £5, John Overman, Burnham Sutton, Burnham Market, Norfolk. (Sold to Mr. Sack, Crawford-street.)

Steers or Oxen, above 3 years old.

First prize of £25, and silver medal as breeder, the Marquis of Exeter, K.G., Burghley Park, Stamford. (Sold to Hayward and Son, Ashford.)

Second of £10, Thomas Swingler, Langham, Oakham. (Sold to Mr. Hook, Hampstead).

Third of £5, Charles Duffield, Marcham Park, Abingdon. (Sold to Mr. Davis, London-road.)

Commended—J. T. Nookes, Brockley, Lewisham. (Sold to Mr. H. Keeble, The Lion, New Cattle Market). R. Wortley, Suffield, North Walsham. (Sold to T. Bancroft, Great Grimsby). E. L. Betts, Preston Hall, Maidstone; and W. Hewer, Sevenhampton, Highworth. (Sold to R. Keyte, Ivy-place, Hoxton).

Heifers, not exceeding 4 years old.

First prize of £15, Gold Medal as best cow or heifer in any of the classes, and silver medal as breeder, Lieutenant-Colonel Towneley, Towneley Park, Burnley ("Beauty's Butterfly").

Second of £5, William Aldworth, Frilford, Abingdon. (Sold to Hedges and Wilkins, of Oxford).

Highly commended—Sir T. Whichcote, Bart, Aswarby, Falkingham. (Sold to C. English, King's-road, Chelsea).

Commended—W. P. Griffin, Borough Fen, Peterborough. (Sold to Mr. Freeman, High-street, Notting-hill).

Cows, above 4 years old.

First prize of £20, and silver medal as breeder, Lieutenant-Colonel Towneley, Towneley Park ("Rose of Towneley")

Second of £10, Richard Stratton, Broad Hinton, Swindon ("Matchless 3rd").

Third of £5, C. J. Bradshaw, Alstoe House, Burley-on-the Hill, Oakham. (Sold to H. J. Dyer, 196, White Cross-street).

SUSSEX.

Steers or Oxen, of any age.

First prize of £20, and silver medal as breeder, John Shoosmith, Berwick, Lewes. (Sold to Mr. Sharpe, Brighton.)

Second of £10, Joseph Montefiore, Worth Park, Crawley. (Sold to W. Shopland, Knightsbridge).

Highly commended—G. C. Coote, Tortington, Arundel. (Sold to Mr. T. Lane, Bristol).

Commended—T. Cooper, Norton, Bishopstone, Lewes. (Sold to Mr. Castle, of Sunbury).

Heifers or Cows, of any age.

First prize of £10, and silver medal as breeder, Thomas Child, Slinfold, Horsham. (Sold to Mr. J. Parker, Brighton.)

Second of £5, Lord Leconfield, Petworth. (Sold to Mr. Withers, Guildford.)

Commended—E. Cane, Berwick Court, Lewes.

NORFOLK OR SUFFOLK POLLED.

Steers or Oxen, of any age.

First prize of £10, and silver medal as breeder, Thomas M. Hudson, Castle Acre, Swaffham. (Sold to Mr. F. King, Paddington-street.)

Second of £5, Lord Sondes, Elmham Hall, Thetford. (Sold to Mr. Petherbridge, Hastings-street, Burton-crescent).

Heifers or Cows, of any age.

First prize of £10, and silver medal as breeder, Robert Cooke, Livermere, Bury St. Edmunds.

Second of £5, Henry Cannon, Bisham Park Farm, Maidenhead. (Sold to Mr. Copeland, Windsor.)

LONGHORNS.

Steers or Oxen, of any age.

First prize, £10, and Silver Medal as breeder.—W. T. Cox, The Hall, Spondon, Derby

Second, £5—*no competition.*

Heifers and Cows, of any age.

First prize, £10 and Silver Medal as breeder—W. T. Cox, Spondon.

Second, £5—R. H. Chapman, Upton, Nuneaton.

SCOTCH HORNED.

Steers or Oxen, of any age.

First prize, £20, and Silver Medal as breeder.—Viscount Boyne, Brancepeth, Durham. (Sold to Mr. Collingwood, Lamb's Conduit-street.)

Second, £10—Thomas Ball Troughton, Foleshill, Coventry. (Sold to Mr. Fowkes, Hammersmith.)

Highly commended—The Duke of Beaufort, Badminton. (Sold to Thos. Pewsey, Bath).

Commended—Lord Middleton, Birdsall, Malton (sold to Mr. Palmer, Wentworth, Rotherham); and T. & W. Martin, Aberdeen (Sold to Mr. Petherbridge, 11, Hastings-street, Brunswick-square).

Heifers or Cows, of any age.

First prize, £10—Alexander Leask, Tattenhoe Bare Farm, Stony Stratford. Silver Medal to the breeder—unknown—*not awarded.* (Sold to Mr. Nickells, Camden Town.)

Second, £5—*no competition.*

SCOTCH POLLED.

Steers or Oxen, of any age.

First prize, £20, and Silver Medal as breeder—William M'Combie, Tillyfour, Aberdeen. (Sold to Mr. Mann, Croydon.)

Second, £10—James Stewart, Newmarket, Aberdeen. (Sold to Mr. R. Jessop, Oxford).

Commended—J. H. Gurney, Catton Hall, Norwich. (Sold to Mr. Collingwood, Great College-street, Camden Town).

Heifers or Cows, of any age.

First prize, £10, and Silver Medal as breeder—T. R. B. Cartwright, Aynho, Brackley, Northampton. (Sold to Mr. Petherbridge, Camden Town.)

Second, £5—John Turvill, Hartley Park, Alton, Southampton. (Sold to Mr. Ackland, Basingstoke.)

IRISH.

Steers or Oxen, of any age.

First prize, £10, and second, £5—*no entries.*

Heifers or Cows, of any age.

First prize, £10—The Earl of Darnley, Cobham Hall, Gravesend (Kerry). Silver Medal to the breeder—unknown—*not awarded.* (Sold to Mr. West, Croydon.)

Second, £5—*no competition.*

WELSH.

Steers or Oxen (Runts), of any age.

First prize, £20—The Hon. Col. Pennant, Penrhyn Castle, Bangor, Carnarvon. Silver Medal to the breeder—*unknown—not awarded.* (Sold to Mr. Dimbelbi, West Smithfield).

Second, £5—J. E. Bennett, Husbands, Bosworth Grange Rugby. (Sold to Mr. Cooper, Newport Market).

Highly commended—F. Neale, Payham, Chichester. (Sold to James Hall and Son, Liverpool).

Commended—Lord Emlyn, Golden-grove, Llandilo. (Sold to J. Wells, Southgate-road, De Beauvoir Town).

Heifers or Cows, of any age.

The prize, £10—J. E. Bennett, Husbands, Bosworth. Silver Medal to the breeder—unknown—*not awarded.* (Sold to Mr. Dimbelbi, Smithfield).

CROSS OR MIXED BREEDS.

Steers, not exceeding 3 years old.

First prize, £15—William Aldworth, Frilford, Berks, (Hereford and Shorthorn). Silver Medal to breeder, Giles Brooks, Lyford, Wantage. (Sold to Mr. Freemantle, Upper Hill-street, Richmond).

Second, £10—Robert Wortley, Suffield Hall, North Walsham (Devon, Norfolk, and Galloway. Sold to Mr. Savage, Norwich).

Commended—J. and W. Martin, Aberdeen (Shorthorn and Aberdeenshire) (sold to F. Spincer, Southampton), and T. Knowles, Aberdeen. (Aberdeenshire and Shorthorn. Sold to Mr. G. Lutton, Dalston).

Steers or Oxen, above 3 years old.

First prize of £15, and Silver Medal as breeder—John Beasley, Chapel Brampton, Northampton (Shorthorn and Highland Scot—Sold to Mr. Mason, Chelsea).

Second of £5—Thomas Knowles, sen., New Market, Aberdeen (Aberdeenshire and Shorthorn—Sold to Mr. Newbury, Chiswick).

Heifers, not exceeding 4 years old.

The prize of £10, and Silver Medal as breeder—Edward Frost, West Wratting Hall, Linton, Cambridge (Shorthorn and Alderney—Sold to Mr. Castle, Hounslow).

SHEEP.

LONGWOOLS.

Judges.—Mr. G. Mann, Scawsby House, Doncaster.
Mr. J. Moon, 18, Tooley-street, London.
Mr. R. J. Wiley, Winterfield, Catterick.

Wethers, 1 year old (under 22 months).

First prize of £20, Gold Medal as best pen of Long-woolled sheep, and Silver Medal as breeder—Francis Jordan, Eastburn, Driffield (Leicesters.—Sold to Mr. Ford, Kenton-street, Brunswick-square).

Second of £15—Richard Newman, Harrowden, Bedford (Leicesters—Sold to Mr. R. Meadway, Brentwood).

Third of £5—Thomas Twitchell, Willington, Bedford (New Leicesters—Sold to Mr. J. Wincott, 30, South-street, Manchester-square).

Wethers, 1 year old (under 22 months), each Sheep not to exceed 220lbs. live weight.

First prize of £20, and Silver Medal as breeder—G. S. Foljambe, Osberton Hall, Worksop, Notts (Leicesters—Sold to Mr. W. C. Hayhow, 2, James'-place, John's-road, Hoxton).

Second of £15—Lord Berners, Keythorpe Hall, Leicester (Leicesters—Sold to Mr. S. West, Croydon).

Third of £5—John Boast, North Dalton, Driffield, York (Leicesters—Sold to Mrs. Payne, 11, Chapel-street, Somers Town).

The Class generally commended.

Longwool Wethers (not Leicesters), 1 year old (under 22 months).

First prize of £15, and Silver Medal as breeder—Jonathan Davis, Webton Court, Hereford (Cotswolds—Sold to Mr. Adams, Hackney-road).

Second of £10—John King Tombs, Langford, Lechlade (Cotswolds—Sold to Mr. F. Hall, 14, Blackmore-street, Clare Market).

Third of £5—John F. Mills, Westwell, Burford, Oxon (Cotswolds—Sold to Mr. Bolton, Hammersmith).

LONG AND SHORT-WOOLLED CROSS-BRED.

Judges.—(And for Short-wools.)
Mr. W. Fookes, Tarrant Monckton, Blandford.
Mr. N. P. Hart, Beddingham, Lewes.
Mr. H. Thurnall, Royston.

Wethers, 1 year old (under 22 months).

First prize of £15, and Silver Medal as breeder—George Hine, jun., Oakley, Bedford (Down and Leicester—Sold to Mr. Huxtable, Brook-street).

Second of £10—George Wallis, Hinton Waldridge, Farringdon (Cotswold and Oxford Down—Sold to Mr. Page, 161, Lambeth-walk).

Third of £5—John Benjamin Twitchell, Wilby, Northampton (Oxford Downs—Sold to Mr. Haydon, Brixton).

Highly commended—C. Howard, Biddenham, Bedford (Oxford Downs—Sold to Mr. Henry Edwards, Tunbridge Wells).

Commended—J. White, Rickmansworth (Cotswold and Down—Sold to Mr. Thomas Worley, of Kensington).

Wethers, 1 year old (under 22 months), each Sheep not to exceed 220lbs. live weight.

First prize of £10, and Silver Medal as breeder—George Hine, Oakley (Down and Leicesters—Sold to Mr. H. Collingwood, Great College-street, Camden Town).

Second of £5—Charles Hobbs, Maisey Hampton, Cricklade, Wilts (Oxford Downs—Sold to Comfort & Son, Farringdon-street).

SHORT-WOOLS.

Wethers, 1 year old (under 22 months).

First prize of £20, Gold Medal as best pen of short-woolled sheep, and Silver Medal as breeder—William Rigden, Hove, Brighton (Southdowns—Sold to Mr. Stevens, Oxford).

Second of £10—The Duke of Richmond, K.G., Goodwood, Chichester (Southdowns—Sold to Mr. King, Paddington-street).

Third of £5—The Earl of Leicester, Holkham Hall, Norfolk (Southdowns—Sold to Mr. Jeffrey, Foubert's-place, Regent-street).

Commended—The Earl of Radnor, Coleshill, Highworth (Southdowns—Sold to Mr. Stimpson, Wandsworth, and Mr. Stewart Marjoribanks, Bushey Grove, Watford (Southdowns).

Wethers, 1 year old (under 22 months); each Sheep not to exceed 200lbs. live weight.

First prize of £10, and silver medal as breeder, William Rigden, Hove, Brighton. (Southdowns.)

Second, £5, to the Earl of Leicester. (Southdowns—Sold to Mr. Jefferys, Foubert's-place, Regent's-street).

Commended, Lord Walsingham, Merton, Thetford. (Southdowns—Sold to J. Cridlan, Jun., Chichester-street, Upper Westbourne-terrace, Hyde Park).

Wethers, 2 years old (above 22 and under 34 months).

First prize of £20, and silver medal as breeder, the Duke of Richmond. (Southdowns—Sold to Mr. King, Paddington-street.)

Second, £10, Sir R. G. Throckmorton, Bart., Buckland, Farringdon. (Sussex downs—Sold to Mr. Jeffrey, Foubert's-place, Regent-street).

Third, £5, Lord Walsingham. (Southdowns—Sold to Mr. Jeffrey, Foubert's-place, Regent-street).

Commended, Lord Radnor, Coleshill. (Southdowns—Sold to Mr. Jeffrey, Foubert's-place, Regent-street).

SHORT WOOLS.

Wethers (not Southdowns), 1 year old (under 22 months).

First prize of £15, and silver medal as breeder, W. B. Canning, Chisledon, Swindon. (Hampshire downs—Sold to Mr. Bottrill, Westminster).

Second, £10, William King, New Hayward Farm, Hungerford. (West-country downs—Sold to Mr. Glass, Lambeth-walk).

Third, £5, Stephen King, Old Hayward Farm, Hungerford (West-country downs—Sold to Mr. Barclay, Titchfield-street).

Commended, F. Sharp, Remenham, Henley-on-Thames, (West-country downs—Sold to Mr. Page, Great Tower-street, City).

PIGS.

Judges:—Mr. G. Mann.
Mr. J. Moon.
Mr. R. G. Wiley.

Not exceeding 4 months old.

First prize of £10, and silver medal as breeder, George B. Morland, Chilton Farm, Harwell, Berks. (Improved Chilton—Sold to Mr. J. Glover, Walworth-road).

Second, £5, William Mills Barber, Sunninghill Wells, Staines. (Improved Middlesex.)

Above 4 and not exceeding 8 months old.

First prize of £10, and silver medal as breeder, George B. Morland. (Chilton—Sold to Mr. Sinkler, Knightsbridge).

Second, £5, Thomas Crisp, Butley Abbey, Wickham Market, Suffolk. (Improved Black Suffolk—Sold to Mr. Silk, Somers Town).

Above 8 and not exceeding 12 months old.

First prize of £10, and silver medal as breeder, George Beale, Frowlesworth, Lutterworth, Leicester. (Improved Leicester—Sold to Mr. John Hogmair, High-street, Poplar).

Second, £5, Henry Wilson, Stowlangtoft Hall, Bury St. Edmund's, Suffolk. (Essex—Sold to Mr. Bonney, Camberwell-gate).

Above 12 and under 18 months old.

First prize of £10, Gold Medal as best pen of Pigs, and silver medal as breeder, H.R.H. the Prince Consort. (White Windsor—Sold to Mr. Nickells, Camden Town).

Second, £5, Edward Sheppard, Roundway-park Farm, Devizes—(Sold to Messrs. Watling and Son, Pimlico).

EXTRA STOCK.

Silver medal for the best steer or ox in extra stock, the Marquis of Exeter (Shorthorn ox—Sold to Mr. J. Saunders, 11, Hampstead-road).

Commended—The Prince Consort (Hereford steer—Sold to Mr. E. Prosser, Pontepool, Monmouthshire; G. C. Coote, Tortington (Sussex steer—Sold to Messrs. W. and T. Lane, Bristol).

Silver medal for the best heifer or cow in extra stock, Earl Howe, Gosfall, Atherstone (Shorthorn).

Commended—Lord Radnor (Shorthorn—Sold to Mr. Young, High-street, Margate).

Silver medal for the best long-woolled wether sheep in extra stock, Lord Berners (Leicester—Sold to Mr. J. West, Croydon.)

Silver medal for the best long-woolled ewe in extra stock Francis Jordan (Leicester—Sold to Mr. J. Langford, 21, James-street, Oxford-street).

Highly commended—Lord Berners (Leicester—Sold to Mr. S. West, Croydon.)

Commended—George Turner (Leicester—Sold to Mr. J. Langford, 21, James-street, Oxford-street).

Silver medal for the best cross-bred sheep in extra stock, George Wallis (Cotswold and Oxford Down ewe).

Highly commended—S. Druce, jun., Eynsham (Oxford Down ewe).

The cross bred sheep in extra stock generally commended.

Silver medal for the best short-woolled wether sheep in extra stock, the Duke of Richmond (Southdown—Sold to Mr. King, Paddington-street).

Highly commended—J. Kent, Goodwood, (Southdown—Sold to Mr. B. Spice, Croydon); Lord Walsingham (Southdown—Sold to Mr. W. Stimpson, Wandsworth).

Commended—W. King (West-country Down—Sold to Mr. E. Collingwood, 10, Westbourne-place, Paddington); Lord Radnor (Southdown—Sold to Mr. W. Stimpson, Wandsworth).

Silver medal for the best short-woolled ewe in extra stock, Lord Walsingham (Southdown—Sold to Mr. W. Stimpson, Wandsworth).

Highly commended—W. Rigden (Southdown—Sold to Mr. Pettie, Hove).

Commended—Sir R. G. Throckmorton (Southdown); H. S. Hayward, Folkington, Sussex (Southdown—Sold to Mr. H. Dennis, Devonshire-street, Lisson Grove).

Silver medal for the best pig in extra stock, Sir R. G. Throckmorton (Berkshire—Sold to Mr. James Nichols, Horse and Groom, Upper Holloway).

Highly commended, The Prince Consort (Windsor—Sold to Mr. J. Glover, Walworth-road); L. Lloyd, Monk's Orchard, Bromley—(Sold to Mr. G. Greenhaugh, Gold-street, Northampton).

MEETINGS OF THE MEMBERS OF THE SMITHFIELD CLUB,

Held in the Yard during the Show-week, Lord Berners in the chair.

The President, the Vice-Presidents, the Trustees, and the Hon. Secretary were re-elected.

The names of Lord Walsingham, and C. T. Tower, Esq., the present Father of the Club, were added to the list of Vice-Presidents.

Mr. Chas. Stokes was elected a Steward of cattle, long-wool sheep, and pigs, in the place of Mr. Torr; and Mr. T. B. Northeast a steward of short-wool sheep and cross-bred cattle, in the place of Mr. Jonas Webb.

The Showyard Committee's report having been read, recommending, in reference to Dixon's Layers near the Angel at Islington, "That if a responsible company be formed, and adequate terms offered to the Club, the Club should lease their exhibition for a term of not exceeding twenty-one years," it was resolved—

"That a Committee be appointed to take such steps as may appear to be necessary to carry out negotiations relative to the site proposed, or any other that may be offered, and to report to a Special General Meeting of the Club in May next, but not to enter into any contract affecting the finances of the Club."

It was ordered that such Special General Meeting be held at two o'clock on the same day as the May General Meeting of the Royal Agricultural Society of England, in 1860.

It was resolved that the day of the Annual Dinner of the Club be fixed for the Tuesday, instead of the Wednesday, in the show week.

Mr. Valentine Barford brought forward his motion as to the unfair system now adopted of trimming sheep intended for exhibition; but, although duly seconded, the proposal was not proceeded with.

The Hon. Secretary was requested to have printed, and furnished to each Member of the Club, the tabular statement that had been prepared of the number of entries in each class, the amounts offered, and the prizes awarded, to enable Members to judge as to any future revision of the prize-list.

It was resolved—"That no article (excepting agricultural books) exhibited in the Implement Galleries be allowed to be removed during the time the show is open to the public."

The balance-sheet, up to the 1st of December, 1859, showed a balance at the bankers of £2,411 9s. 2d., and in the hands of the Hon. Secretary of £11 6s. 11d.

It was accordingly ordered that, after the prizes and bills connected with the present show have been paid, £500 of the surplus annual income be invested, and to so remain till wanted for current expenses.

THE IMPLEMENT GALLERIES OF THE SMITHFIELD CLUB SHOW.

It is not our purpose to give any lengthy description of the implements at the Smithfield Club Show. It is sufficient to offer two reasons for this course. In the first place we could not see them; and in the second, they are not the main feature of the show. The region of Baker-street is not the most lively and lightsome of places at the best of times; but it is specially sombre during November and December—fog prevails, and bids defiance to any gas to disperse or illumine it; so that the task of the intelligent observer, groping amongst machinery, to some of which he may have been introduced for the first time, is often trying enough.

But had light been granted, space is denied. The efforts of connoisseurs in art are nothing when they seek, on the opening of the Royal Academy's exhibition, to discover the merits of many a *chef d'œuvre*, hung hopelessly above the line, in comparison to the despair of the determined reporter, who find curious pieces of mechanism suspended high above reach, ploughs perched upon turnip-cutters, and corn-dressing machines upon corn-crushers. It is difficult enough to form an opinion of an implement where its motions can be inspected; but it is perfectly impossible to say anything with certainty of an object upon which none of the senses—saving the imagination—can exercise themselves.

It formed no part of the original design of the Smithfield Club to exhibit implements, or to afford space for them; and if it be considered by the makers to have now become an essential part of the Christmas Show, they must be prepared to unite with the Club and the Public to erect a building worthy of the object—that object being an exhibition of the fattening properties of the varions breeds of cattle, sheep, and pigs, as well as to show to the public the mechanical means that have been introduced to economise human labour—to increase the power of this kingdom, without increasing its consumption.

Without stopping, however, to discuss whether Islington or Kensington Gore will furnish the best site for such a building, it will be well just to remind the progressive farmer of the number of intelligent mechanics who are hourly engaged in furthering his designs, smoothing his difficulties in all gradations of work, from ploughing to sowing, reaping, and marketing the produce. Not unfrequently he looks incredulously upon their good intentions we know, but on cool reflection he sees he has no better friends in the world than the Implement Makers.

There are Howard and Ransome, and Hornsby and Ball, ready to plough the land upon the most approved principle; while everybody seems ready to harrow it. Coleman, Bentall, and Clay are prepared to cross the inverted furrow, drag out the weeds, and create a thoroughly pulverized seed-bed, into which, in all possible methods, the Garretts, Hornsbys, Taskers, Holmes, Priest and Woolnough, Smith and Reeves are anxious to drop the seed, leaving nothing for the patient husbandman except to wish for the morrow. Nor is the young plant neglected. The weeds that cumber its growth are cut down in the most expeditious and effective manner by Garrett, Speight, Nicholson, and Priest and Woolnough. The corn ripe, Burgess and Key, the Croskills, Dray, Cuthbert, and Samuelson are waiting to mow it down at a rate varying from 3s. 6d. to 5s. per acre. A host of cart and waggon-makers are willing to carry it to the stack, of whom the Crosskills, Busby, and Melton stand prominently out to view; while Oliver Maggs, with Moody's straw-fabricating machine, requests to be allowed to thatch it down. Their name is Legion who engage to thrash the corn at fabulous prices; above all of whom, perhaps, for combined excellence of engine, drum, and dressing apparatus, stand Clayton and Shuttleworth; while those who offer to riddle, sift, and prepare the grain for market are even more innumerable. Whichever way we turn, some kindly individual—filled with that species of benevolence which characterizes the enlightened human race in this day—awaits an opportunity to aid our plans and conserve our strength. Is the grass ready for the scythe, Burgess and Key step up and say, "Kind sir, allow me; my machine will cut your crop better and cheaper than men—try it." You are prevented incurring the expense of people to "shake out of swathe" by Nicholson, and Smith and Ashby, who offer to scatter out the grass evenly over the field, unravel the "locks," and throw it all to the winds and the sun, ready for Howard, with his horse-rake, to gather with the utmost cleanliness and expedition. No sooner was it understood that hay and straw would go twice as far by being sub-divided, than chaff-cutters sprung into existence, and have now reached perfection in Cornes' and Richmond and Chandler's machine. Let only be once determined that roots were best for cattle, sheep, and horses in a sliced, grated, or pulped condition, than Gardner introduced his turnip-cutter, Bentall his root-pulper, and a variety of makers modifications of the same. If the old process of milling is too tiresome and slow, Tuxford will supply a 2½-horse steam engine; Clayton and Shuttleworth, or Turner of Ipswich, will furnish grist-mills; corn-crushers will be forwarded by Ransomes, and Richmond and Chandler, and Turner; and under one roof devoted to the preparation of food, all these will work, together with chaff-machines and root-pulpers, concocting incipient beef and mutton. This is done. Believe Biggs and Long, and your sheep shall never waste away under virulent attacks of scab; and should you wish it, doubtless you may soon see your sheep seated on a platform, embraced by steel arms, slowly revolving to meet the inevitable shears. Time fails in which to sing this Song of the Age—this Pastoral of the Nineteenth Century. We warn our readers to look for it from time to time in the public prints, and we think it may possibly appear in the columns of this journal in the month of July next.

No sooner do we desire a rotary corn-screen than we find the want instantly supplied. Indeed, this is amongst the novelties of the show. But for the price, it seems likely to surpass Boby's justly-celebrated machine, because by means of a very simple arrangement the distance between the wires can be increased or diminished, while in Boby's machine they remain invariable. The motion being rotary too, much friction is avoided. This cylindrical screen is four feet in length, and two feet in diameter. Nothing, however, can be said of it with certainty, since it is only just introduced. The demand for a cheaper and more effective corn crusher than those now out is not long heard before the same firm responds to it. Certainly their combined oat and bean crusher, price £7 10s., is the best we have seen. It was described at the Warwick Meeting, and we shall not now refer to it at greater length. As this is the season during which most attention is given to feeding cattle, it will be well also to direct attention to Wood's (Stowmarket) root-pulper, price £4 15s., which works with great celerity and ease, pulping one bushel of roots in two minutes. We saw many good pulpers, but none that combined in greater degree the merits of excellence and cheapness. An intimation was given by Mr. Caird, in his "Farming in the Prairies," of a revolving harrow that worked well, and lo! Crosskill (A. and E.) introduce it to the farmers of England, bearing out our assertion that somebody is always alive to their interest. These harrows consist of two circles of iron, with radii proceeding from the centre to the circumference, which carry the teeth. These two circles, which cover a space of eight feet, are connected through their centres by a rigid bar at right angles to the line of draught. No machinery is employed to make these circular harrows revolve, but the revolution is caused by an inclination of the axis, giving the teeth a greater pressure on either side, and by this means the circles can be made to rotate in contrary directions. They should work well, and very economically; but practice must prove their value.

The most marvellous narration is yet, however, to come. What must be said of Fowler, Smith, and Halkett? of whom it is true that "the good they do lives after them." Most unmistakable will be their footprints upon the strata of the Period. Imperishable are the lives of those who produce for mankind a practical solution of the Impossible. The application of steam-power to the cultivation of the land is now the great question of interest. These gentlemen are all prepared to cheapen and facilitate all processes of tillage. Their methods are somewhat different, but their purposes are alike straightforward and honest. The fostering care of the Royal Agricultural Society is doing its work. The trials effected in two or three days, under restricted circumstances, can now be confirmed by the experience of hundreds of practical tenant-farmers who adopt steam to plough land and clean stubbles, and prepare seed-beds, under all possible circumstances. The assertion that steam as applied to the cultivation of the soil is more economical and advantageous than horse-power, no longer proceeds from one or two solitary individuals, but from the convinced hearts of hundreds. It is no longer a theory upon which we might be prophetic, but an accomplished fact, from which strong irresistible conclusions have been deduced. We place our feet firmly upon this vantage-ground of fact, and reach forth into the future with the same confidence that determined Columbus to breast the waves of the Atlantic, defiant of a mutinous crew. Nor would we deny a word of encouragement to the brave Romaine. A self-contained machine, can it ever be produced, must possess vast superiority over those now in use, inasmuch as a direct communication of power is less expensive than the transmission of that power by means of wire-rope.

And there we found these men in the galleries of the Bazaar, waiting to confirm the strong, to alarm the indifferent, and to lead the timid persuasively into the New and Better Way. It is a privilege to meet face to face with our benefactors—a privilege usually denied to Hero-worshippers.

THE SMITHFIELD CLUB DINNER

Took place on Wednesday, in the show week, at the London Coffee-House, Ludgate Hill, the large room at the Freemason's Tavern not being this year at the disposal of the Club. There was an attendance of over a hundred members and others. In the absence of the President his Grace the Duke of Richmond, who has just resumed his military duties in Scotland, the chair was taken by Lord Berners, one of the Vice-presidents of the Club. The Vice-chair was filled by Mr. W. Torr, and among those also present were Lord Feversham, Lord W. Lennox, Mr. Milward, Mr. Fisher Hobbs, Mr. Alderman Mechi, Mr. Brandreth Gibbs, Professor Simonds, Mr. Jonas Webb, Mr. G. P. Tuxford, Mr. Rigden, Mr. Sanday, Mr. R. Smith, Mr. Hudson of Castleacre, Mr. Quartley, Mr. C. Stokes, Mr. Wilmore, Mr. Giblett, Mr. E. W. Bennett, Mr. Corbet, Mr. H. Smith, Mr. H. Waters, Mr. J. Ford, &c.

After the usual loyal toasts,

The CHAIRMAN said there were certain periods when particular toasts had a peculiar interest attaching to them, and he felt that to be the case then with regard to the toast which he had risen to propose, namely, the health of the brave defenders of our country. It would be useless and presumptuous for him to enter into details in reference to the gallant deeds performed by the army and navy in past times. Those deeds, or at least many of the principal ones, were engraved on the minds of every Englishman; he was confident that the hearts of the British soldier and British sailor were as true, and their hands as strong, as they were proved to be at various periods of the country's history. It was thought by some persons that needless fears had of late been excited in this country, but he felt that the surest way of preserving peace was to take care to be prepared for war. One reason why this toast excited special interest at the present time was, that there was now being added to the regular forces an old constitutional force, which he well remembered having seen in his boyhood, when, as in this day, hundreds and thousands of persons cheerfully and readily enrolled themselves as volunteers. He need not tell those whom he was addressing that volunteer rifle corps were now being established in all parts of the kingdom, forming a most valuable auxiliary to the regular army. He hoped to see a much greater extension of this force. He had indeed no fear that the illustrious man who presided over the destinies of France would, of his own free will, ever invade this country; but he was, like others, to a certain extent the creature of circumstances, and when they knew that he had a standing army of from 500,000 to 700,000 men flushed with recent victory, and when they knew also that there existed among military men in France, if not among a large portion of the French people, a strong desire for the wiping off of what was supposed to be a stain on the national honour—though at the same time there was no doubt a vast number of persons in that country connected with agriculture and commerce, who felt that nothing could be so suicidal, on the part of France, as her entering into a war with this country—none of them could help feeling that the country ought to be in such a position that it would not be at all dependent upon the will, the caprice, or the forbearance of any individual or nation on the Continent. Therefore it was that he rejoiced to witness a revival of the spirit which in his youth animated every breast when invasion was threatened. He hoped to see rifle corps established in all directions; and in the presence of those who represented on that occasion the farmer's of England, he must say that it was to such persons, in a great degree, to their sturdy hearts and their strong arms, that the country must look for its protection, and that if a foreign army dared to land on the shores of this country, though it might inflict an immense amount of mischief at the outset, yet it would in the end be repelled if not entirely destroyed. Having made these remarks he would give the toast of "The Army and Navy." He knew not whether there was any gentleman present connected with the latter service; but he thought that in the absence of their noble President the Duke of Richmond, who had devoted himself to the army, he could not do anything more grateful to the feelings of the company than the coupling of the toast with the name of his Grace's brother, Lord William Lennox (cheers).

Lord W. LENNOX, in responding to the toast, said he was no longer a member of the army; but having passed the greater portion of his life in it, he felt great interest in all its movements. There never was a period in the history of this country when there was such a martial feeling in the community in general as prevailed at present, and he was convinced that that feeling did not arise from any desire for the extension of the British empire, but solely from a determination to resist any attempt at invasion. He did not himself share in the panic of the Liverpool merchants; nor did he believe that if the Emperor Napoleon had any desire to pay a hostile visit to this country he would throw aside the extreme cautiousness of character which might have led him to reply to the gentlemen at Liverpool It was difficult to conceive anything more ridiculous than the letter which elicited the Emperor's answer, supposing that letter was not, as it was said to have been, a hoax. He was quite sure that the present sovereign of France would not wage war against this country, unless it were for the purpose of saving his dynasty; though that would, after all, be short-sighted policy, as it would probably lead to the destruction of his own power. Many persons spoke as if the Emperor had already crushed our fleet, silenced our gunboats, and landed his forces—as if our army had retreated, our riflemen had proved inefficient, our artillerymen were asleep, and the French were already in London; but he belived that so long as the people of this country maintained their present attitude there would be no danger of invasion. No one ought to desire to see the present martial spirit allayed; for the best way of preserving peace was to take care to be prepared for war (cheers).

The CHAIRMAN then proposed "Success to the Smithfield Club." It was, he said, now rather more than thirty years since he first became a member of that club. Since that period he had attended most of its meetings, he had watched with great interest its progress; and, notwithstanding the cavils which he had heard with regard to its proceedings, he did not hesitate to say that the club had conferred great benefit on the country (cheers). It had been the means of exciting great emulation among the breeders of cattle; it had been instrumental in producing the animals which would provide the greatest quantity of food for the people, at the smallest cost. It was established rather more than sixty years ago, being founded in the year 1798. The number of members was at first very small. For many years the show was held, as many present must remember, in an inconvenient place in Goswell-street. About twenty years ago it was removed to Baker-street. At that period, the proprietor of the show-yard in Baker-street gave them £300 a year for holding their show there; and he thought he might justly congratulate the members on the fact that in one respect at least the club was unique, seeing that, instead of paying for their accommodation, they were paid for accepting it. For some years they had received the sum he had mentioned — £300 per annum; they now received £700. The non-members of the society who showed live stock paid about £115 per annum, the implement department yielded £740, the steam-engine exhibitors contributed £50, they had a dividend arising from Government stock of £56, and the annual subscribers paid £235. There were 364 members. The number of entries of new stock this year—including pens of three, five, and so on—was 365; and they had distributed in prizes for cattle £950, and in medals £140, making, in round numbers, a total of £1,100. He dare say all present were aware that steps were being taken to secure better accommodation for the exhibition of cattle, that being a matter of absolute necessity; and he hoped they would terminate in a satisfactory change. Two years hence, probably, better accommodation would be provided, both for stock and for implements, the implement department being one of very great importance to agriculturists. Having made these remarks, he now proposed that they should drink, "Success to the Smithfield Club."

The toast was received with great enthusiasm.

Before the reading of the awards of prizes for gold medals in the several departments,

The CHAIRMAN said he was sure the company would be very much pleased if any of the successful competitors who might be present, would favour them with the results of their experience, and with any hints which might tend to promote the main object of the club.

Mr. BRANDRETH GIBBS, the Honorary Secretary, then proceeded to read over the names of the winners of the Gold Medals. Mr. Shirley for the best Ox, Colonel Towneley for the best Cow, Mr. Jordon for the best Long-woolled Sheep, Mr. Rigden for the best Short-woolled, and His Royal Highness the Prince Consort for the best Pigs. Neither Mr. Shirley nor Colonel Towneley were present, but Mr. Jordan very briefly acknowledged the compliment paid him.

On the presentation of the Medal to Mr. Rigden, the CHAIRMAN congratulated him on having fulfilled his promise that he would, if possible, beat the Duke of Richmond.

Mr. RIGDEN, in responding to the toast of his health, which was very warmly received, assured the company that it had given him great satisfaction to have been enabled to redeem his promise to beat the Duke of Richmond. He regretted that his Grace was not present on that occasion, as, if he had been there, a few pleasant words might have been interchanged between them in reference to the result of their competition. He really thought that some credit was due to him for beating the Duke of Richmond, though perhaps none would have been due to his Grace for beating him, as he had, he believed, much greater difficulties to contend with than were experienced at Goodwood. It was no uncommon thing for him to find his sheep running about a field with a lady's dog at their heels; and if he found any fault with the lady on that account, he would probably be regarded as one of the greatest brutes in the world (laughter). Many persons present could have no idea of what he had to endure in consequence of his farm being in the vicinity of Brighton. Although he always endeavoured to bear this with good temper, it was, nevertheless, a great drawback. Hitherto he had generally won the gold medal once in four years. Three years was, however, rather too long a period for him to lie fallow; and he would therefore, in imitation of his Grace, endeavour to have the credit of taken it three years in succession (cheers).

Mr. TORR proposed the health of the president of the Smithfield Club, his Grace the Duke of Richmond. He said words would fail him if he attempted to enlarge on the merits of the noble duke, or the noble simplicity of his character, or the earnestness of purpose which distinguished all his conduct in connection with agriculture. It was evident, too, from the cause of his absence on that occasion, that his patriotic anxiety on behalf of his country had undergone no diminution, but had rather increased with the increase of years. He was still as anxious for the welfare and efficiency of the army as when, as the Earl of March, he followed the Duke of Wellington to victory. It would be quite superfluous for him to remind that assembly of his Grace's ardent and tried friendship for the British farmer. He was one of the best friends that the farmers of England ever had, while his reputation as a sheep-breeder stood so high, that it was a great honour to Mr. Rigden that he had gained a victory over him.

The toast was drunk with enthusiasm.

Lord W. LENNOX said, he rose on behalf of the Duke of Richmond to return thanks for the very handsome manner in which the toast had been proposed, and for the enthusiastic reception it had met with. It was but justice to his brother to say that his heart was with them on that occasion. He had a conversation with him about a month ago, when he came from Scotland, to be present at his daughter's marriage, with regard to that dinner; and his Grace said that if he could possibly come from Glasgow, where his military duties now detained him, he would certainly do so. He felt sure that nothing ever gave him greater pleasure next to the honours which he had received at the hands of the Sovereign, and which he could not help saying he richly deserved, than to enjoy the good opinion of the members of the Smithfield Club, and mingle with them on occasions like that He hoped he should not be considered unbrotherly if he said he was not sorry that Mr. Rigden had beaten the Duke. He knew his brother wished for a clear stage and no favour, and the fact of his having been beaten this year would make him the more zealous and more energetic in future, in order that he might recover the laurels he had lost. Mr. Rigden had spoken of the pet dogs which seemed to hover more particularly in the neighbourhood of Brighton, and of the advantage that Goodwood possessed in that respect over Hove. Now, he could tell Mr. Rigden that there were a great many pet dogs to be found at Goodwood, spaniels and other varieties of canine animals being often seen scaring the flock. Moreover, there was a large assemblage of persons once a year at the Goodwood Races, and he believed that if a fair comparison were entered into, it would be found that the pet dogs of Brighton ladies who visited Hove did not do half so much mischief as the London rabble who went in such vast numbers to Goodwood (laughter). He knew that his brother had been obliged to sell off many of the deer in his park in order to obtain for his sheep a better refuge against many who came to the races. He repeated that his brother would, he was sure, have felt great pleasure in being present that evening. But Glasgow, where he was staying with his regiment, was a long way off, and the Duke's coming just then would certainly have interfered very much with the discharge of his military duties. A striking illustration of his brother's military zeal was afforded about two years ago. The Duke's militia regiment being on duty at Brighton during the Christmas season, nearly every officer went home for a short period to enjoy the Christmas festivities, and the result was that the colonel of the regiment was seen dining alone with the one junior subaltern officer (cheers).

Mr. HUDSON (of Castleacre) proposed "The Vice-Presidents of the Smithfield Club." In doing so, he remarked that the usefulness of the club must be admitted by all who bore in mind that but for the exertions of such associations it would have been almost impossible for the butchers to obtain a sufficient supply of meat for their consumers. The climate of this country was such, that the people required a very large quantity of meat as compared with the people of many other countries, and hence the necessity of carefully providing for the wants of the community. If he might be allowed to make a digression, he would observe that now that there was more wheat in this country than could be consumed, it might perhaps be desirable that producers of stock should give their cattle some of the surplus wheat, and thus convert it into meat. He did not believe that meat could, with the present prices of wheat, be produced in any cheaper manner; and he threw this suggestion out with the view of benefiting alike the graziers and the consuming millions.

Lord FEVERSHAM, in responding to the toast, said he regretted that that duty had not devolved upon some one who had been a vice-president of the club for a longer period than he had. He could, however, assure the assembly before him that he and his colleagues felt a deep interest in the proceedings of the Smithfield Club, and that they were delighted to find such marked improvement from year to year in the exhibitions of stock and implements. That such improvement had been going on for a long period, and more especially during the last ten or fifteen years, was a fact which no one would venture to controvert. A friend of his, who was present that day, Mr. Fisher Hobbs, had stated that day that he had attended the anniversary dinner of the Smithfield Club for the last thirty-one years. That being the case, Mr Hobbs was well fitted to bear testimony with regard to the progress of the club; and he was sure his testimony must be, that the whole of the recent proceedings evinced a most marked improvement as compared with those of former periods of the club's history. There was one further improvement which he (Lord Feversham) agreed with Lord Berners was highly desirable should be adopted; he referred to the removal of the show to a place more spacious, more convenient, and more commensurate with the importance of the object than that in which it was now held. He trusted that that improvement would, ere long, be effected. Having made these remarks in response to the toast, he would now propose the health of his noble friend in the chair; and as two years ago, when he had the honour of proposing the same toast, his noble friend rather complained of the compliments which he paid to him, he would simply say on this occasion that, in proposing the toast of his noble friend's health, he asked them to drink the health of one who was at all times very anxious to promote the welfare and prosperity of British farmers (cheers).

After a warm reception of the toast,

The Chairman, in responding, said he could truly declare that he had devoted a large portion of his life to the improvement of agriculture, and that nothing was more grateful to him than to meet an assemblage of British farmers, and receive from them the slighest meed of their approbation. He felt that agriculture was one of the most important branches of the national wealth, and was most desirous of promoting the extension of those feelings which ought to exist reciprocally between landlord and tenant (cheers).

Mr. Milward having proposed "the Judges," the toast was briefly responded to by Mr. Sanday, the only Judge present.

Mr. Bennett proposed "The Stewards." In doing so he took occasion to advert to the subject of the removal of the Cattle Show to another site, and expressed it as his opinion that Islington afforded the very best site that could be obtained.

Mr. Torr, after returning thanks, said it was very easy to find fault with the premises in Baker-street, but he could assure the meeting that it was very difficult to find other premises which would be in all respects better. In a pecuniary point of view no fault could be found with the holding of the show in Baker-street. With a subscription list of about £300 the Club obtained an aggregate of from £1,400 to £1,500 a year, in other words they had a return of more than 300 per cent. for their outlay, and from this return they were enabled to carry something to capital account. He would, with the permission of the noble lord in the chair, make one or two practical remarks with regard to sheep. He did not think it would be possible to see greater improvement than was exhibited by the Southdowns. Last year and this year a Yorkshireman had also done something towards bringing back Leicesters to their proper form. He was confident that if Mr. Bakewell had been living now, while he would have adapted his system to the altered state of things, he would at the same time have avoided violent crossing, which had produced very bad effects. Mr. Torr proceeded to deduce that the Leicesters of Mr. Sanday, as well as his own, were cultivated on this principle of judicious selection, rather than of calling in much fresh blood.

Mr. Fisher Hobbs said he had been entrusted with a toast, which would, he was certain, meet with a very cordial reception. They had that evening toasted the President, the Vice-presidents, and various officers of the Club, but there was one gentleman in that room, who had, perhaps, contributed more to the successful working of the club than any one who had been officially connected with it during the last twenty years. Lord Feversham mentioned the fact that he (Mr. Hobbs) had attended the annual dinners without intermission for upwards of twenty years. On looking round that room he could see only three gentlemen whom he was in the habit of meeting on such an occasion during the earliest period of his connection with the society. Year by year had he seen improvements taking place, and during the last few years, when they were most marked, the club had been especially indebted for its progress and its systematic arrangements to the energy and the organ of order which so remarkably characterised the official conduct of the honorary secretary Mr. Brandreth Gibbs. The duties which devolved upon the stewards and the judges had been greatly lightened by the excellent arrangements made by that gentleman and the recent success of the Smithfield Club was mainly—or at all events, in a great degree, attributable to his extraordinary exertions. He always met every officer of the club and every member in a gentlemanly manner; and his deportment had made him popular, not only in that club, but also in the Royal Agricultural Society of England. He had been most exemplary in the performance of his duties as Honorary Director of that Society's Show; and the agricultural community at large was greatly indebted to him for having come forward, at a period when the Royal Agricultural Society was without a secretary, to perform the duties of the office efficiently and gratuitously (cheers).

The Chairman said he could himself have testified to the indefatigable labours of Mr. Gibbs, not only as secretary of that club, but latterly, while filling the gap in the same department of the Royal Agricultural Society; and he agreed with Mr. Hobbs, that a deep debt of gratitude was due to him on that account (cheers).

Mr. Gibbs, in acknowledging the toast, said he felt deeply grateful for the kind manner in which his health had been proposed and received, as it showed that any services which he might have been enabled to render, were fully appreciated. This year he had been prevented, by the cause which had just been mentioned, from devoting to the club as much of his time as he could have wished. If there had been any omission on his part, he was sorry for it; but, as regarded his position at that moment, when he told them that he had been taking notes, as Secretary of the Royal Agricultural Society, from 10 o'clock that morning till half-past 5 in the evening, they would, he was sure, excuse him, if he did not make a long speech. He would only say, in conclusion, that as long as his services were considered worthy of acceptance, they would be placed willingly and heartily at the disposal of the club.

Mr. C. Stokes proposed the health of Mr. Tower, the father of the club, who, however, was not present.

The Chairman gave "The Butchers," a toast that elicited no response; and Mr. Robert Smith "The Agricultural Labourer," with which the proceedings terminated at a rather late hour. Mr. Genge, as usual, had the direction of the musical arrangements.

THE OLD NORFOLK FARMER AT THE SMITHFIELD SHOW.

London, Dec. 10.

Sir,—The closing month of another year has brought round the annual gathering of agriculturists and others connected with their branch of industry, to examine those quadruped *protegês* of the farm who seem, by their generally quiet and orderly demeanour, and their aristocratic bearing, to be fully conscious of the important part they play in the affair. These meetings constitute a striking illustration of the freedom we enjoy in England, by the deep interest manifested by all classes and descriptions of persons in the exhibition. To the exhibitors it is an affair of intense expectation and anxiety, to the successful candidates an ovation, to the general body of farmers a holiday; whilst to the public at large it is a subject of curiosity, wonder, and delight: even the genuine cockney would not, on any account, omit going to the "Cattle Show," taking with him his wife and children, albeit many of them scarcely know the difference between a bull and a cow, and certainly are none of them versed in the mystery of the various breeds of the animals exhibited; yet would they not be considered ignoramuses, and therefore never fail to touch the sides of the cattle—timidly it is true, for fear it should be done unscientifically. Well, let that pass. Here we are, in the midst of "beef and bucolics," which form an appropriate and appetizing exordium to the war to be commenced on the 25th between "Turkey and Grease," if I may be allowed the perpetration of so vulgar a thing as a pun. Doubtless this war will be attended with as much bloodshed as that of Solferino, although the "butcher's bill" will be less costly to the nation. And now to business.

Ah! here stands, first and foremost, a Devon steer, belonging to the Earl of Leicester, "the very effigy," as old writers used to say, of those I saw at Holkham, when attending, for the first time, in 1806, the sheep-shearing of T. W. Coke, Esq., afterwards Earl of Leicester. I am old, and unfashionable enough to regret that that honoured and renowned name should ever have been smothered by the dust of a resuscitated peerage. The generation (of which I am proud of forming a member) to whom that name is a household word is fast dying out. In looking round the markets which I was accustomed to attend, I now see very few of those who were cotemporary with the "Holkham chieftain," and the rising generation will only be acquainted with the name as a subject of history. Holkham Hall, it is true, still remains, and the domain is an ever-living witness of the undying fame of the man who made "the wilderness to blossom as the rose," and converted a sterile and intractable soil into a perfect garden of production. But I am strangely digressing from my subject. How is this? No. 1 does not obtain a prize this year! After upwards of fifty years' practice, has the Holkham grazier suffered his stock to degenerate? Be this as it may, I rejoice to see the principle of strict impartiality exhibited by the judges in passing by No. 1, and awarding the first prize of £25 to No. 6, to which is attached the plebeian and diminutive cognomen of "Robert Farthing," of North Petherton; the second prize of £10 to "John Dunning, of Creech St. Michael" (both in "Zumerzet"); and the third of £5 to William Heath, of Ludham Hall, near Norwich, who was dragged into notoriety last season by a very questionable charge, which was most satisfactorily rebutted. The Earl of Leicester, therefore, with No. 1, went into the background. I have referred particularly to this first class, as an illustration of the fairness and impartiality by which the decisions of the judges are pronounced, and without any intention of going through the various classes in the same minute way, which would occupy too much of your space.

It appeared to me that the Devon cattle sustained their reputation for condition and appearance better than any of the other breeds, although there were some noble specimens amongst each. They do not, however, keep up their size and weight as formerly; and in this respect only they appear to me to have degenerated. Possibly, some of the breeders may have kept on without changing their stock; and it would be well for them, perhaps, to procure bulls of the original breed from Devonshire. This also may apply to the other races, which require renewing as time wears on.

Mr. Farquharson's Devon ox (No. 15) was a magnificent animal, and the first prize in Class 2 was justly awarded to him; his Royal Highness the Prince Consort coming in second-best, the only cattle prize obtained by him this season. There was one animal in this class which I thought should not have been passed over—No. 13, the property of Mr. H. H. Ball, of Hankridge, which seemed to me superior to No. 14, which obtained the second prize. The Devon cow, No. 32, Class 4, was a beautiful animal, and sustains Mr. Heath's credit as a grazier, as does also the Hereford ox No. 44, Class 6; both these obtaining the first prizes, respectively, of £20 and £25. The Hereford cattle were generally good, but few of them were what I should call very superior. This was also the opinion I formed of the Shorthorns, which appeared to me to have been less sedulously cared for than usual. Whether this was fancy, or whether it has arisen from the depressed state of the farming interest, I must leave other and better judges than myself to determine; I certainly thought that, generally speaking, the cattle-show was not equal to that of former years. One thing, however, I was glad to see, although it may have originated in one of the causes I have stated: very few of the cattle in any class exhibited that error of overfeeding which results in rendering their carcases unfit—I had almost said—for human food. It is perfectly disgusting, the idea of sitting down at table to a mass of blubber only fit for an Esquimaux or the tallow-melter! What on earth is the use of keeping pigs three months after they become blind with fat, and unable, from the smallness of their bones, to sustain themselves upon their legs five minutes at a time? These Daniel Lamberts of the stall and the sty are only fit to be exhibited, like him and other obese monsters, at so much a head, and, when dead, to be converted into candles; being, as I heard a gentleman remark, "better for the lights than the liver."

But what have we got here? That giant with huge horns can never be a Highland Scot, with which breed I have always associated the idea of smallness of carcase with (like most little people) abundance of pugnacity. We used (my father and I) to purchase generally the Galloway Scots; but one year we purchased a dozen of those irascible gentlemen the Highlanders, who soon showed that the old feud was still in existence; for they drove their Lowland companions fairly out of the yard, with sundry holes in their sides from their detestable horns, which were as sharp as needles. But this monster of a Highlander is quite another class animal, and I find belongs to the West of Scotland (Angus), and seems as quiet and orderly as if he was an elder of the kirk. Not so a polled gentleman a few stands from him. Look at that eye, with "a lurking devil in its leer," as Shakspeare says. He has adopted for his motto, "*Noli me tangere*," as I found to my cost; when I touched his ribs, he flung out at me sideways. I escaped. Standing a moment to watch his pranks, another person stepped before me, and began examining him quite scientifically; when another fling of the left leg sent him heels over heads against me. "'Tis well," thought I, "you have no horns, my fine fellow, or you would play the mischief with them."

Of all breeds of sheep, I admire the pure Southdowns: there is something so quiet and modest in their behaviour, so gentlemanly in their "dress," if I may use the word, that they commend themselves to everybody's goodwill. Those of Mr. Rigden, who bore off the first prizes in Class 35 & 36, and the Duke of Richmond's, who also gained the first prize in Class 37 and the second in 35, were perfect aristocrats for symmetry of shape and fineness of their coats. The Holkhan sheep, too, were very excellent; but I missed with regret the stock of my countryman, Mr. H. Overman, of Weasenham, whose flock was sold off last spring, and who has since himself been removed from this world, we trust, to a better. And thus, another of my contemporaries, whose father I knew fifty years ago, has admonished me that my own days are almost numbered.

The show of long-woolled sheep did not appear to me so good as last year, the Cotswold particularly. It made me think that the farmers begin to feel the times, and are less disposed to expend money in the perfecting of their stock. Those of Mr. Foljambe gave me the most pleasure to look at them. The pure Leicesters are indeed a handsome breed of sheep, improved as as they were by Bakewell. The Cotswolds are large and coarse, but are well suited to supply the manufacturing and other densely-populated neighbourhoods. Besides which, they are a hardy breed, and will thrive in situations where the Leicester and the tender Downs would scarcely live.

I now come to the pigs, last, but not LEAST, in the literal sense of the word, as compared with the sheep. Observe those masses of fat in Class 41, No. 327, 11 months 21 days old. They almost appear to have neither eyes nor nose, both being hidden by fat. "What do they weigh, think you?" said I to a butcher. "Well, I think they weigh up'ards of 40 stun." Forty stone for a pig under a twelvemonth old! The pigs royal did not shine quite so much as usual, though his Royal Highness the Prince Consort took the first prize in Class 42. Those of Mr. G. Morland, which took the first prizes of Class 39 and 40 (Nos. 314 and 322), were very superior stock; but, generally speaking, if tendency to fattening and precocity are recommendations, most of the pens exhibited were highly creditable to the graziers.

On the whole, I have been quite as much gratified as usual; not the least source of which is the continued, if not increased, interest displayed by the public at large in this most useful Institution, which is now become a national feature, although not under the surveillance of the Government, nor subject to the officious annoyance of police regulations, like those of the French. The spontaneous offspring of the farmers themselves, and supported by them without any extraneous aid from the public purse, the Smithfield Club and their Cattle Show are the result and the evidence of that freedom which is the foundation and the support of all national prosperity. I must leave my remarks on the machinery department for another week.

An old Norfolk Farmer.

THE CATTLE SHOW.

Mere idlers are not the anxious, cautious heads engaged all the week in manipulating and admiring the scarifiers and reaping-machines and steam-ploughs in Baker-street. If farming is all that its extant instruments and implements betoken, it is among the most difficult of economical pursuits. The British farmer must be an accountant holding his own against Messrs. Quilter and Ball; for he must be able to get the exact cost of every bushel of corn raised on his fields, and of every beast and sheep consigned to the butcher. He must know what he wins and loses by every acre, and he must be possessed of the natural history of every bushel of manure throughout its career of raw material, grass, beef, or flour. In other words, the farmer must be a good arithmetician, something of a chemist, not unacquainted with animal and vegetable physiology, a practical mechanician, skilled in at least the theory of several branches of natural philosophy, possessed of that administrative faculty which can rule and attract subordinates, with moral qualifications which, to say the least of them, must embrace sobriety, punctuality, quickness, tact, and what is generally known by business habits. If the farmer is not this, he is nought; and the fact that the trade has compelled him to be this is not the least of its blessings. There is probably no class which the last quarter of a century has so much elevated and refined as that of the British farmer. And it would be a great mistake to suppose that all that the agricultural and bucolic multitude hurry to Baker-street for is to prod into the fat sides of the Hereford ox or Devon heifer, or to gloat over the super-porcine developments of the Prince Consort's prize pen. Not the least important part of a first-class agricultural show is the department of roots, seeds, grasses, and instruments. Probably there is an element of quackery in many of the specimens exhibited. The preternatural mangels and kohl-rabis, and the preposterous cabbages and parsnips, cannot have attained their surpassing size at remunerative culture—neither can the cattle. But it is with these things as with all heroes. They present types, standards, ideals, to which perfection tends; but only in this sense are they a guide to the ordinary laws of production. It is not meant or suggested that all oxen should, even in the most optimized condition of bovine existence, attain the majesty of Mr. Shirley's or Mr. Nailor's Hereford, or the virgin graces of that milk-white Io, Colonel Towneley's wonderful heifer. It is not that the show aims at compelling all porkers to equal the lazy majesty of the pigs who, in stately and Oriental *nirwana*—in the serene luxury of self-contemplation and ecstacy of absorption from the eternal world—pillow their chins on those happy cylindrical blocks which the thoughtful care of the guardians of their years has provided for their amiable depth of dewlap—if a pig may be said to have dewlap. This is not what stall-feeding leads to. The show in Baker-street is rather designed to present to the practical farmer a proof of the capacity of the material with which he has to deal.

And this value of the exhibition is great. It is impossible for even the most unimpressible of farmers not to carry away something. Those mild and stately Herefords, and those crisp and elastic fleeces—already almost woven fabrics, so clean in fibre and so close in texture—of the short-woolled sheep, must haunt the sloven, not only in visions of the night, but in his daily tramp. Nor does the exhibition only teach the farmer how mutton and beef and pork can be produced in the shortest time, even if at an advanced expense of material; but it teaches this: Science, it may be, exhibits itself at present but in its first contact with agriculture, and certainly not in its most attractive guise. It seems almost as if agricultural machines were more complex than any other, more armed with threatening spikes and jagged teeth, more involved and more horrisonous than those of Staleybridge and Manchester. Is it not in the infancy of science that its machinery is so complex? We trust so, and that farming machines will become simpler, and their principle more intelligible. The farmer must be coerced into abandoning his Virgilian plough and the Hesiodic waggon, which is still too common; but the great desideratum of farming machines is simplicity of construction. And here we notice some waggons really elegant in form and construction, and of the simple, natural oak, varnished, and undisguised with paint. If these carts and wains are as substantial as they are elegant, high art has actually penetrated into the homestead. All this is a great benefit to the community. Scientific chemistry, the literature of agriculture, steam cultivation, and beauty of form developing itself in tools and implements, must elevate, and that very rapidly, the character of the cultivator.—*The Saturday Review.*

THE METROPOLITAN GREAT CHRISTMAS CATTLE MARKET.

Monday, Dec. 12.

The steady upward movement in the value of live stock during the present year, in the face of full average supplies, and the enormous consumption going on in nearly all parts of England, have produced much interest as regards the result of the great Christmas market, appointed to be held to-day. The grazing community have regarded with some anxiety the value and importance of extensive crossing in a pecuniary point of view, and consumers have shown themselves fully alive to the producing powers of the country; in other words, they have been desirous of ascertaining how far extensive crossing has increased the quantity of food, when compared with what is termed the "pure" system. That the system has been highly successful in each point of view is evident from the general weight and condition of the bullock show here this morning. It is quite true that the past has been a favourable season for rearing and feeding stock, the weather having been fine, and the supplies of natural and artificial food very large; still it is gratifying to observe that the origina breeds of the country have not deteriorated, and that we have, consequently, good and pure blood to fall back upon for future supplies. And here we may remark that we have seldom witnessed so *even* a mixture of each kind of stock as on the present occasion; in point of fact, it was one of the best shows ever witnessed, not only for the butcher, but the consumers. We may, perhaps, take the Scots as a leading breed, viewed as regards their peculiar merits. In them, we found points of the highest value, and not a few of them were of enormous weight, without indicating other than good symmetry. This particular breed arrived in full average number, not only from Scotland, and even its most northern parts, but, likewise, from Norfolk and some other counties. The crosses may, we think, be next alluded to as stock of a first-class character. These animals were, so to speak, "all roast beef": they were of enormous weight, and of undoubtedly good symmetry. In reference to the Shorthorns, it may be observed that there were fewer out-of-size animals amongst them than has been noticed in some former years; and, in our judgment, they were far more suitable for general consumption. We do not assume for a moment that this most valuable breed has deteriorated; on the contrary, our impression is that moderately-fat animals pay the grazier much better than those thirty or forty stones over what may be termed a moderate weight. We now come to the Devons. The changes in this breed are important ones, since not an inferior bullock was on show: there was very little difference in their respective weights, and, consequently, they produced high quotations. The Herefords may be classed next. Amongst them were animals of great merit, with noble frames, and of first-class quality. It may be stated, however, that the actual number shown was not equal either to 1858 or 1857. The Sussex breeds next command attention. For the most part they were extremely good, but their ages—some of them being 7 years old—were against an active trade; nevertheless, the number increased in a comparative sense, and the quotations realized were fully up to 4s. 8d. to 4s. 10d. per 8lbs. There were some remarkably prime Welsh runts on offer, and there were large numbers of Steers, Heifers, and Oxen from various localities—and mostly mixed—which added greatly to the interest of the show. From Ireland some remarkably good beasts came to hand, and produced high quotations. If the Irish graziers can readily produce stock of the description exhibited here to-day, surely they might make an effort to improve their position in the Smithfield Club. This year the show of Irish beasts in the yard was a poor affair indeed.

The following return shows the number of Beasts exhibited, and the prices obtained for them, on the great days in the last eighteen years:—

YEAR.	BEASTS SHOWN.	PRICES.
1841	4,509	3s. 8d. to 5s. 0d.
1842	4,541	3 4 ,, 4 8
1843	4,510	2 8 ,, 4 4
1844	5,713	4 0 ,, 4 6
1845	5,326	3 6 ,, 4 8
1846	5,470	4 0 ,, 5 8
1847	4,282	3 4 ,, 4 8
1848	5,942	3 4 ,, 4 8
1849	5,765	3 4 ,, 4 6
1850	6,341	3 0 ,, 3 10
1851	6,103	2 8 ,, 4 2
1852	6,271	2 8 ,, 4 0
1853	7,037	3 2 ,, 4 10
1854	6,181	3 6 ,, 5 4
1855	7,000	3 8 ,, 4 2
1856	6,748	3 4 ,, 5 0
1857	6,856	3 4 ,, 4 8
1858	6,424	3 4 ,, 5 0

The total imports of foreign stock into London last week amounted to 4,311 head. In the corresponding week in 1858, we received 4,322; in 1857, 1,773; in 1856, 1,622; in 1855, 4,752; in 1854, 3,999; and in 1853, 6,316 head.

IMPORTS INTO LONDON LAST WEEK.

FROM WHENCE.	BEASTS.	SHEEP.	LAMBS.	CALVES.	PIGS
Rotterdam....	460	1398	—	293	—
Harlingen	90	1221	—	—	—
Hambro'......	49	522	—	—	—
Dort	25	45	—	—	—
Tonning......	59	121	—	—	—
Bremen	2	—	—	—	—
Antwerp......	—	—	—	26	—
Total....	685	3307	—	319	—

The yearly comparison of weekly imports is as follows:

	BEASTS.	SHEEP.	LAMBS.	CALVES.	PIGS.
1858....	310	3781	—	229	3
1857....	259	1361	—	156	—
1856....	499	919	—	204	—
1855....	859	3555	—	238	—
1854....	1139	2593	—	269	7
1853....	1130	4698	—	462	20

Mr. Robert Morgan had on sale a large number of remarkably fine Beasts from Aberdeenshire, fed by Messrs. Kidd, Cooper, Stodart, and Mitchell; also some first-rate animals belonging to Mr. Ploughright, Mr. John Allday, Solehill, and Mr. J. Towers, of Ludlow. There was on Mr. Morgan's stand a very fine collection sent by Mr. Robert Leeds, of Lexham, Norfolk, Mr. Freeman, near Lynn, Mr. Gilliot, and Mr. Kendal.

Mr. Maidwell had 32 Scots of very fine quality, forwarded by Mr. M'Combie, of Tillefour. Mr. Lamb exhibited 44 wonderful Scots from Norfolk, and Mr. Senior, of Broughton House, near Aylesbury, had, as usual, some remarkably fine animals. Mr. George Dickson had a large collection of prime animals forwarded from Scotland, the property of Messrs. Knowles, Martin, Thompson, Kidd, Bruce, Stodart, Longmore, Tait, Wishart, Frost, and other graziers of Aberdeen and Banffshire. Mr. Collins showed some prime Beasts, belonging to Mr. Overman and Mr. J. B. Ellis, and Mr. Hall, of Norfolk, likewise some good Devons and runts from Buckinghamshire. Mr. Giblett had a fine show of beasts sent by Mr. A. Mennie, Mr. Stewart, and Mr. Martin, of Aberdeen.

Amongst the Sheep we noticed some prime flocks: the 65 Gloucesters sent to Messrs. Weall by R. Rowland, Esq., of Creslow; Mr. Ball, Mr. White, &c., of Oxon and Berks. Messrs. Giblets and Gurrier had a good collection. Mr. Mawer showed some fine Sheep fed by M. Hanley, Esq., of Croft. Mr. Eland had a fine show of heavy Sheep from Lincolnshire and other quarters. The bulk of these were sent by M. Heanly, Esq., of Croft, C. Smith, of Frampton, and others. Mr. Thomas Dodds had a prime collection of animals from the flocks of Mr. Streatley, of Berks, Mr. King, of North Stock, Mr. J. Franklin, of Oxon, &c. Mr. Russell sold some fine foreign Sheep at over 70s. each.

State of the Trade.

The total supply of Beasts was a very large one, and its general quality was unusually prime. Owing to the small number of country butchers in attendance, the trade was far from active. However, the best Scots, &c., sold at 5s. 4d. per 8lbs.; but other breeds moved off slowly at late rates.

We were seasonably well supplied with Sheep. Prime Downs and half-breds were firm, and rather dearer, the extreme price being 5s. 6d. per 8lbs. Most other breeds were a moderate inquiry, at late rates.

Prime small Calves moved off steadily; other kinds of Veal slowly, at previous currencies.

Pigs were a dull inquiry, but not cheaper.

LONDON, OR CENTRAL FARMERS' CLUB.

THE COMPOSITION OF DIFFERENT VARIETIES OF VEGETABLES AND PLANTS, AND THEIR RESPECTIVE VALUES AS FOOD.

The monthly meeting of the Club was held on Monday evening, December 5, at the club-house, Blackfriars; Mr. John Thomas, of Bletsoe, in the chair. The attendance of members was very numerous.

The subject for discussion, introduced by Mr. J. C. Nesbit, of Kennington, was, "The Composition of different varieties of Vegetables and Plants, and their respective Values as Food."

After a few introductory remarks from the Chairman,

Mr. **Nesbit** spoke as follows:—Mr. Chairman and gentlemen, the subject which I have to bring under your notice this evening, is "The Composition of different varieties of Vegetables and Plants, and their respective Values as Food." For this purpose it will be necessary for me to trace generally the nature of plants, the mode of their growth, and the various products which they bring forth, as regards the farming of various countries, and more particularly as respects that of our own. It is impossible for me to enter fully into all the details of this subject. What I propose this evening is, to give you a general view of the properties of the plants which you cultivate; not entering into so much detail as regards particular varieties of plants as I intend to do when the investigations on which I am at present engaged are completed. You will, I am sure, excuse me if I address you on this occasion simply as a teacher or instructor. I know there are many persons here who are acquainted with the nature of those things of which I am about to speak; but others are not, and if I were to take up too scientific a position in stating the results of my experiments or researches, I should probably not afford so much satisfaction as I may do through simplifying the matter to the utmost of my ability. I shall, therefore, endeavour to do this, and begin at once with the plants themselves and their structure. Plants—I am now speaking of land plants—have their rootlets down in the soil; they have their stems, and they have their seed-producing parts; and there is a sequence of life from the moment of germination upwards, till they again produce seeds. In this process a great number of things are comprehended. In the first place, according to the different varieties of plants you must have the materials from which they will grow. It is necessary that I should mention at once what those materials are, because I intend to trace in the plants themselves the process by which they form the materials that constitute the food of animals. In the first place, then, I say, plants derive from the soil a proper quantity of mineral matter, supposing it either to have been there naturally, or to have been placed there by the art of man: secondly, they find in the soil some available sources of organic matter; but they obtain from the air the chief amount of these substances. Now, I wish to point out the differences between the mineral and the organic matter. The plants obtain from the soil their mineral matter: from this matter all the bones of animals are formed; and if the plants had not the power of obtaining from the soil the mineral matter required by animals, animals could not subsist upon them. The other matter, that is the organic, is composed of four elementary substances, namely, carbon, hydrogen, oxygen, and nitrogen. There is a great difference (and I wish particularly to impress this point on the minds of all the gentlemen who are present), there is an immense difference in the habits of plants; and while certain conditions will do very well for certain plants, for others they will be found not at all adapted. We find, for example, that some plants will only live on the previously-produced juices of other plants, being, for example, such parasites as the mistletoe and the dodder; while others, again, live on the bare rock, and from the mineral matter of the rock and the organic matter of the air they by their growth make a mixed soil adapted for the growth of other plants of higher organization. What I have to do to-night, however, is to speak more particularly of the plants required in farming operations to produce the food of animals and men. Out of hundreds and thousands of the plants of nature you select a certain number, in order to provide sustenance and make the utmost profit that you can. These plants require both mineral matter, and matter which I call organic, which is derived from the air and from what comes down from the air, or from the rootlets of previous series of plants which grew in the soil, and there decompos, to furnish gradually to subsequent plants what they might not otherwise have obtained in sufficient quantity. Now, with respect to the growth of plants, when the seed is in the soil we have first the germination there; we have little rootlets sent downwards and little germs sent upwards; and this goes on at the expense of the seed which was sown, until the root meets in the ground the mineral material which it requires. The rootlets descend into the ground till they meet with mineral materials, which sent into the leaves through the action of the sun absorb organic matters from the air, which uniting with the proper mineral constituents produce all the various vegetable fibres and structures necessary for the continuance of the life of the plant. When this life has commenced, it must continue until the destruction of that particular plant takes place; and when that occurs, you have, as the natural end of the life of the plant, the production of seeds of its own kind, calculated to continue the life of the species. In the growth of the seeds, after a certain portion of time has elapsed, the whole of the stem and of the roots begin to feel an absorbing power, and the nutritive material which has accumulated, or the chief portion of it, is withdrawn from the stem and rootlets, and accumulated in the seed, so that under all conditions the seed of the plant constitutes the most valuable portion of it. In almost all cases in which food is required, the seed is the plant's most valuable substance. This product is always found to be more conducive to the support of animals—that is to say, a smaller quantity will be more valuable—than any other portion of the plant. Take the root, or the straw; these will bear no comparison whatever with that which is the ultimate product of the life of a plant, namely, the seed itself, which has been ordained to be the reproducer of the life of the species. It so happens, also, that herbivorous animals, and animals that live upon vegetables, and so on, obtain in the various seeds a larger amount of support than they can possibly derive from any other form of vegetable matter. You will find the production of seed to be one of the most important points in the whole economy of farming.

The greatest efforts are now made to produce the largest quantity of wheat, the largest quantity of oats, the largest quantity of beans, and so on; and we are introducing into this country from abroad seeds of various kinds, which are all supposed to have one characteristic in common, namely, that they possess a large amount of nutritive power. We get locust beans and Indian wheat because they are substances which are so valuable that they will bear the expense of importation to this country. The straw—I am speaking now of plants that have given their seed—the straw has been searched, as it were, by the production of the seed, and has had nearly the whole of the nutritive power taken from it; the roots, in like manner, have had their more valuable materials taken from them, and condensed into the seed; and hence, gentlemen, the seed is that to which I would have you pay special attention. I have now to speak on another point, namely, the effect of manures on the production of plants. Before doing that, let me observe that what we call the roots of turnips and mangel wurzel are not, botanically speaking, roots, but bulbous formations, intended to accumulate the necessary materials for the production of seed in a subsequent year. Now as regards the growth of plants, there is one thing which ought to be borne in mind by those who are practically engaged in the work, namely, that you may over-produce a thing, or stimulate one portion of a plant to the detriment of another portion. You know that if you sow wheat upon a dunghill you will get straw, and no grain. The reason of this is obvious; and it applies not merely to wheat, but to a great many other plants to which it is not generally supposed to apply: it is, that the action of too large an amount of stimulating manure at an early period is, to cause the formation of large cellular tissues, by which the power of the manure is thrown too much into the formation or production of the first portion of the plants; and when you want afterwards to fill the cells with the materials of nutrition, it turns out that you have stimulated the plant too much, and that you have nothing to follow on with. In the case of turnips the result is simply this, that you have a large development of leaf, and too great an extension of the cellular tissues of the turnip, which cells do not subsequently get filled up with the proper amount of starch and other nutritious substances. In the case of wheat the result is similar. You may stimulate wheat, or barley, or oats to such an extent that the product will be all stalk, there being no power to produce the ear of corn; or if the ear be produced, it will contain no seed, or seed of inferior quality. It is for this reason — the question being one to which my attention has been directed for some years—that I have recommended the use of salt and lime, and other substances of the same kind, which have the power of arresting the too-early growth of wheat or other straws when your object is to obtain the ear. I think this cannot be repeated too often, for I am sorry to say that, notwithstanding all that has been said on the subject, the facts do not seem to be yet sufficiently appreciated by those who are practically engaged in agriculture. There are only a certain number of weeks after the first germination of wheat occurs, before the ear is formed. Now if you can stop the too great growth of the straw in the early period before the formation of the ear, the power of the manures which you have put on the land will be thrown directly on the second period of the life of the plant, the seed will be greater in quantity, and the sample of corn undoubtedly better. I cannot cite a better illustration of this than that which is afforded by the experience of the last year, when we had, as a general rule, too much straw, and too little corn. If you do what I have referred to, in any single case, when you ultimately want the last product of the plant you will find that you have done wrong. On the other hand, if you require the earlier product of the plant, if you require the mere grass or hay, you cannot manure too highly with ammoniacal and phosphatical matters in order to obtain the largest quantity of produce. In all cases in which you want the early product, the grass or hay, you cannot do better than apply ammonical and soluble phosphatical manures to the greatest extent in your power. As regards the substances produced by vegetables for the use of animals, I must call your special attention to three which are required for the maintenance of animal life. Let me take first the great basework of the animal, the bones or the osseous system. Unless the vegetables on which the animal lives contains the mineral matter which is derived from the earth, in sufficient amount to furnish the animal with the requisite phosphate of lime and other substances, the animal system cannot be maintained. Then, again, there is the muscular system by which the motion of the animal is obtained. We have from various matters the formation of the nervous system, which gives nervous energy to the animal, and conveys the power of voluntary and involuntary motion. Beyond this, there is the necessity connected with all vegetable matters that they should contain a sufficient amount of materials for keeping up what is called animal heat, a certain temperature being essential to their very existence. We have, thus, three points presented to our view in connection with this part of my subject. Now, reverting to the condition of different varieties of vegetable substances which I have mentioned—namely, the roots, the stems, and the seeds—I have to state most distinctly that the seeds contain the greatest amount of the most essential materials; they contain the largest quantity of phosphates and of those substances which form the muscles of man, and of the oleaginous and starchy matters required for respiration and the production of fat. Now, I must remark that the elements of nutrition consist of four organic substances—carbon, hydrogen, oxygen, and nitrogen. These are the component parts of all those portions of our bodies which give us the power of motion; and there is no portion, that I am aware of, where nitrogen is not found, which gives us any power of motion or action. On the other hand, the elements of respiration and producers of fat consist of substances containing carbon, hydrogen, and oxygen, but no nitrogen. which is the essential element of flesh. The substances found in vegetables are oil, fat, cane sugar, grape sugar, sugar of milk, starch, gum, mucilage, &c. Now I must explain the use of these substances. I cannot illustrate this better than by referring to the composition of milk. Milk contains sugar of a peculiar composition, called sugar of milk; it contains caseine, albumen, and several other nitrogenous substances, and is found to be adapted for the growth of animals; it is in fact that which nature has herself perfectly adapted for their growth, and we cannot do better than approach near the point which is presented in the production of the natural food of animals whose stomachs are delicate and young. But let us separate these. One of the first necessities of life is, that the animal heat should be kept up, and that a sufficient quantity of certain substances should be taken, which serve to maintain the temperature of the body. These substances are found to rank chemically in a category corresponding with that in which charcoal, coke, and coal are placed by chemists, or by those who manufacture steam-engines, or any other species of machinery in which fuel has to be consumed. When we have the proper power we have to eliminate that power, to produce it in various forms according to the direction of our own mind or will. But we cannot do this without the fuel. The consequence of our attempts to do so would be a cessation of existence; but through the use of the proper amount of power, the whole of the animal functions are carried on. Animal heat is produced by the consumption of the carbonaceous elements of food by means of the air inhaled by the lungs. Now, what is the next condition? what is the result of our taking more than is required for the simple production of animal heat? The excess of starch or sugar, gum or fat, or any other oleaginous matter, goes into the body, and forms part of the animal system; it is laid on in the form of fat, and is so laid in order that, in the event of any subsequent reverse by which the animal might be temporarily deprived of its food, it might have within itself a certain amount of resistance to the action of the atmosphere. This condition also distinctly supposes that the colder the animal is, the more of these substances it must consume before any fat can be produced. It distinctly discloses to us the necessity of warmth for the animal; warmth is, in fact, an equivalent for food. And as coal is very much cheaper in proportion than any of the substances containing hydrogen and carbon which are given to animals as food, it follows that it would even pay well to use artificial heat to keep animals warm when there is a deficiency of heat, as coal is much less expensive than the carbon and hydrogen in their food. But to come to a more ordinary state of affairs, I would remark that protecting animals from cold, by putting up a small shelter, is equivalent to the saving of a large amount of food. Mr. Robert Smith practically took notice of the effects of shelter, in his admirable paper on the management of sheep, in the "Journal" of the Royal Agricultural Society. A few years ago, a friend of mine in Dorsetshire put up twenty or thirty sheep under the simple protection of a series of upright double-hurdles lined with straw, and with a single hurdle lined with straw as a sort of roof or lean-to. Another series of the same number and weight were fed without any similar protection, but in the open field. Each were allowed to eat what turnips they liked. What was the result? Those without shelter increased in weight 1 lb. per sheep per week: those with shelter increased at the rate of 3lb. per sheep per week, and consumed less food. Had the weather been more severe, the difference would of course have been still greater. The employment, then, gentlemen, of all the means at your command to protect your animals from cold, and to keep up animal heat, is, I think, an essential thing for the production of the largest weight with the least food in the least time. Now, when animals have taken food, there is a question respecting their growth. Animals that are young require considerably more materials for food in connection with their weight than animals which have reached their full stature. Animals which are young require to be furnished with the natural means of attaining their full growth, and by which they may be enabled to perform their proper functions as regards exercise and so on. The manuring matters in their deposits will, therefore, be found to be of far less value than those contained in the deposits of older animals. Animals which have acquired their full growth have simply to maintain it, and will therefore require less food than those which have to increase their growth; so that the value of the manure will differ according to the difference between the animals themselves, supposing that they both obtain the same quantity of food. We now come to another question, namely, what food ought to be given to animals, and in what varieties? I have shown before that the seeds of a plant are undoubtedly those portions of it which are of the greatest importance to the agriculturist, and that the straw and other portions are of the least importance. But we must recollect that some of these may be of greater value locally than others. The seeds of oleaginous plants are those which have generally proved most valuable, such as those of linseed, rapecake, and other oleaginous plants, as, besides a large amount of flesh-producing principles, they contain the largest amount of fat-producing principles; and next come substances containing, besides the flesh-producing principles, starch, for example, wheat, barley, and oats. But the straw—I am obliged to allude to this question, and I know my opinion will be corroborated by every practical man present—the straw is not that which is the most nutritious for animals, and the hydrogen and carbon to be found in it do not exist under the same conditions that they do in oilcake, linseed, and other substances of the same kind. In straw, which is nearly all woody fibre, you may have a certain amount of carbon, oxygen, and hydrogen, existing in a state which may be assimilated by animals; but it is not to be supposed that 100 lbs. of these substances in straw will do as much for a bullock as the same quantity in oilcake and other similar substances. The weights may be the same, but the compounds adapted for food are totally different. Since I addressed you on this subject twelve months ago, I have been at the trouble of reading over almost everything that has been written, in order to see if what was stated does exist in straw, and I am satisfied that its value as a food has been exaggerated. This time last year there was an assumption made, founded I believe, on a portion of an excellent paper of Mr. Horsfall's, which led me to say instantly, for the sake of practical men whom I did not like to have misled, that it could not be correct; I refer to the assumption that wheat-straw contains 18 per cent. of oil, or the equivalent of that quantity of oil. In order to see whether or not there was such an amount of oil in the straw as had been stated, I got my friend, Mr. Mechi, to send me some of his own straw for analysis, and the result of the analysis was as follows:

ANALYSES OF STRAW FROM MR. MECHI.

	Wet. Per cent.	Dry. Per cent.
Moisture	10.68	—
Oil, &c.	0.75	0.84
Soluble in water	8.81	9.86
Albuminous compounds	3.15	3.53
Woody fibre	71.17	79.68
Ash	5.44	6.09
	100.00	100.00

Another sample of straw kindly sent to me by Mr. Charles Howard, of Biddenham, near Bedford, was analysed with perfectly similar results.

ANALYSIS OF STRAW FROM MR. HOWARD.

	Wet. Per cent.	Dry. Per cent.
Moisture	11.46	—
Oil, &c.	0.74	0.83
Soluble in water	7.48	8.45
Albuminous compounds	3.15	3.56
Woody fibre	71.97	81.29
Ash	5.20	5.87
	100.00	100.00

Samples of the same straws were likewise submitted to Professor Johnson, of Guy's Hospital, who was also unable to detect the presence of starch.

On the other hand, an analysis of a sample of oilcake gave the following result:

ANALYSIS OF OILCAKE.

	Per Cent.
Moisture	11·60
Oil	11·08
Albuminous compounds, or flesh-producing principles	26·13
Ash	7·20
Other constituents	43·99
	100·00
Nitrogen	4·09

ANALYSIS OF RAPECAKE.

	Per cent.
Moisture	7.50
Oil	10.60
Albuminous compounds, or flesh-producing principles	33.34
Ash	9.00
Other constituents	39.56
	100.00
Nitrogen	5.22

The result of a comparison is to show that oilcake is, so far as oil is concerned, of 15 times greater value than straw; and I perceive that in this work, which was referred to by Mr. Mechi, 36s. is set down as the value of a ton of straw. The assumption that is erroneous, I say, is, that a certain amount of carbon, oxygen, and hydrogen in straw is equivalent to a certain amount of oil, starch, or sugar. I beg to say that so far as my experiments have gone they show that assumption to be utterly unfounded (cheers). During a twelvemonth's investigation I have seen nothing which tends to show that that, which Mr. Mechi spoke of as existing in straw, is equivalent in value to a corresponding amount of oil, fat, starch, or sugar. I must, therefore, recommend you, gentlemen, not, till you have proof that you would be right in so doing, to discontinue the use of oilcake and resort to the feeding of cattle on straw (cheers). The analysis of rapecake and oilcake show also that they are nearly equal in feeding properties, and I have no doubt that in time rapecake will be much more largely employed than at present. Let me further remark, that all the parts of plants have some functions to perform, and may be used. There is a certain amount of feeding material in wheat straw, bean straw, and other straws, but it is very small compared with the amount contained in seeds. The chief use of such things is to add bulk to the food, because the animals that you usually feed, namely, herbivorous animals, and those which are in the habit of ruminating, required a large quantity of solid matter. We know very well that if persons eat honey by itself they will become sick. The Indians when they have found a bee-hive in a tree get some of the rotten wood of the tree and mix it with the honey, knowing from experience that too large an amount of strong food is injurious. With respect to straws generally, my opinion is that they are exceedingly useful if properly employed. To this I would add that if you fed animals on straw you would find the manure very different from what it is when they have been fed on oilcake or any similar feeding substance. I must reiterate that I would advise you not to use too large a quantity of stimulating manure for plants, unless your object be simply to obtain grasses. You should, of course, apply good manures—such as well-made dung, guano, or other nitrogenous substances—to your corn crops; but you should, at the same time, use something that will tend to arrest the first action of the manure, such as salt, in order that you may have the benefit of its action afterwards in the production of the grain. In the case of turnips and other root crops, it is, in my opinion, necessary to take care that too large an amount of soluble phosphate should not be given to the plant, that a considerable amount of the phosphates should be not exactly insoluble, but still, in a state in which there will be less power of solution, in order that a certain amount of materials may be furnished to the plant in the months of October and November. There should be soluble phosphates, to enable plants to pass the fly and assume the broad leaf. I believe that if my recommendation on this subject were followed, there would be fewer failures of turnips than have been seen recently. Mangel-wurzel generally requires higher manuring than turnips These opinions are the result of practical observation. Time will not permit me at present to lay before you an extensive series of analyses in which I have been engaged; but the results will be sent to the chief agricultural organs, and to each of the members of the club. I conclude, gentlemen, by thanking you for the kind manner in which you have listened to my remarks (cheers).

It is necessary to state here that Mr. Nesbit retired from the room at the conclusion of his lecture, being so much indisposed that he had been accompanied to the room by two medical attendants, and had delivered his lecture in opposition to their advice.

Mr. **Bond** (Ipswich, Suffolk) could not help expressing the pleasure with which he had listened to Mr. Nesbit's introduction. It had struck him that the remarks that gentleman had made with regard to over-manuring, and the consequent formation of extreme cellular tissues in straw, were well worthy the consideration of farmers in connection with their daily culture of the soil (Hear, hear). He found that in Norfolk the barley had, owing to excess in manuring, been completely thrown down; and farmers in that part of the country were now adopting the system of growing barley after wheat-stubble, instead of growing it after the turnip crop. As regarded straw for feeding purposes, it was quite evident that its value arose not solely from the nutritive properties in the straw itself, but from the fact of its bulk, and of its enabling animals to derive the entire nutrition from other more valuable substances which they consumed therewith, so that nothing was wasted. They knew also from experience that the manure of a young animal was not so good as that of an old one, and this seemed to lead to the conclusion that it was most advantageous to fatten the young animal. Of course it was a mere question of pounds, shillings, and pence, depending upon market prices; but as a principle the young animal manufactures the largest amount of manure from a given amount of food.

Mr. **Wells** (Booth Ferry House, Howden) said he had hoped that Mr. Nesbit would have gone a little further into the question, especially as he found upon the card the words, "their respective values as food" (Hear, hear). They found a very great difference between mangel wurzels and turnips, and, knowing that Mr. Nesbit had had great experience in the analyzing of various foods consumed by animals, he should have felt much obliged for any information on the subject of relative values.

The **Chairman** here explained the indisposition of Mr. Nesbit, and observed that but for that he would no doubt have entered into the question much more fully than he had done.

Mr. **Wells** said if he had been at all aware of what the Chairman now stated, he should certainly not have complained. He hoped, however, that the branch of the subject which he had mentioned would be discussed at some future time (Hear, hear).

Mr. **Coussmaker** (Westwood, Guildford) must confess that he also had felt somewhat disappointed at not hearing something about the relative values of those kinds of food on which they were in the habit of feeding their animals—not straw and other substances of that kind, which were only make-shifts, but mangel wurzel, swedes, carrots, parsnips, and other roots. Moreover, had Mr. Nesbit given them the relative values of these roots, he should like to have heard at what period of the year they were taken. Different roots had always appeared to him to vary in value at different periods of the year, and taking all the values at a particular time might be disadvantageous to some kinds of roots. As regarded early feeding, he had always thought that a good sound turnip was the most nutritious thing, swedes not having at that time obtained their nutritive properties. After that came the swede; and in the spring, when swedes became leathery, they would be enabled rightly to appreciate mangel wurzel. Mangel wurzel was, in fact, a root which clay-land farmers could hardly appreciate too highly. It was, no doubt, abused very much, owing to ignorance of the proper use of it. It was often used too early; but after other roots had lost their nutritive qualities, mangel wurzel displayed its full value.

Mr. **Stokes** (Kingston, Kegworth) said he rose to corroborate Mr. Nesbit's opinion with regard to the virtue of straw. In his own experience, he had found it a good corrective when given with other substances; but those who imagined that they could fatten their cattle by giving them straw, would find themselves very much mistaken in the end. There was one question which he would have asked Mr. Nesbit if he had not left the room, namely, at what period he would recommend them to apply salt to wheat and other plants. His own custom had been to apply it in March or April, and he had found it answer remarkably well; but still he would be glad to know whether or not that is the best period for the application of salt. In feeding his animals, he used mangel wurzel from the beginning of October till January, and they did very well upon it. The grand and great point was, he thought, to avoid giving more than was necessary to keep the animal's body in a proper state (Hear, hear). Observing that precaution, they would, he believed, find their beasts thrive on mangel-wurzel, and grow faster than they would do on any other description of vegetable food.

Mr. G. **Dobito** (Lidgate, Newmarket) said as they had been deprived so early of the presence of Mr. Nesbit, and as mangel-wurzel was so great a boon to the occupier of heavy land, it would be very advantageous if gentlemen who had been in the habit of using it largely for some years would inform them at what periods and in what proportions they had generally used it. It appeared to him that it might be advantageously used in moderation at any time (Hear, hear).

Mr. C. **Howard** (Biddenham, Bedford) said he had risen at the request of one or two gentlemen, who knew that he had been in the habit of using mangel-wurzel early. He had used it as early as August for the sheep which he had annually exhibited at the cattle-show, and there was no other root which they ate with so much avidity as mangel-wurzel. He had also been in the habit of using it as soon as he got it off the land, that is, early in October, continuing to use it throughout the winter. There was one great advantage in mangel-wurzel, which all who grew it were well acquainted with, namely, that they could obtain double the weight that the swede turnip would yield. He had that year drawn off half his mangel-wurzel to feed lambs and ewes in other parts of his farm, and he did not hesitate to say that the weight now was equal to that of the same acreage of swede turnips. As regarded straw, he thought all the most practical farmers would bear Mr. Nesbit out in saying that it was very little use to put straw alone into the stomachs of animals; they all knew from experience that, if animals ate only straw, their manure was of very little value. He thought the pulping system was of great importance in relation to the use of straw. He had himself recently adopted it on a small farm he occupied in Bedford, and had found considerable advantage accruing from it. Growing as he did very little hay on this farm, he had adopted pulping for the corn-chaff which was produced on it, and with this food only slightly flavoured with clover-chaff the animals looked exceedingly thriving.

Mr. **Coleman** (steward to the Duke of Bedford) had been in the habit of using mangold all the year round, and certainly there was no root which the animals would eat so readily, whilst there was nothing which tended so much to increase their weight. Upon one farm which he was then managing he had a flock of 600 sheep, which had been eating mangold for the last two months, and he believed it was impossible for any sheep to do better. Next week they were to be sold for Christmas meat, and he should have an opportunity of ascertaining whether the butchers considered them as good as if they had been fed upon swedes or other roots. The farm to which he referred produced little or no hay; and having a great many roots to consume in the yards, he was compelled to use straw. The result was that he kept one-third more cattle by that system than by giving them the turnip, cake, or other feeding substance by itself. Whether the system might answer where hay was grown, and a large quantity of fodder produced, he had yet to learn; but upon the light lands of Norfolk, where he had been accustomed to reside, and where hay was a more valuable article than in the midland counties, straw was not only useful, but almost an absolute necessary (Hear, hear). It must be left to farmers themselves to discover what was the right quantity of straw to use. Too much straw tended to injure young animals to a great degree, unless it was given with mangold. He was satisfied that mangolds must come into more extensive use than ever it had done yet; and it must be grown, not only on heavy, but also on light lands. Year after year they found swedes more difficult to grow, and the reason of that difficulty was not made clear. Swedes, indeed, were subject to so many diseases that they were not a certain crop, even in the best swede-growing districts of the country. The chief obstacle to the growth of mangold was, perhaps, the immense amount of labour entailed by the necessity of storing in a busy season of the year. But they had now the steam-engine on the land; and he looked forward to its being applied not only to ploughing and cultivating, but to assist in drawing off the crops of mangold wurtzel (Hear, hear, and a laugh).

Mr. C. **Howard**, in explanation, wished to be understood as not advocating the entire use of straw.

Mr. W. **Bennett** (Cambridge) said there was no doubt hat swede turnips had, of late years, become an exceedingly precarious crop, both in the growth and the keeping. He had endeavoured to reduce them upon his farm as far as practicable; and now only one-fourth of his root-crop consisted of swedes, although formerly they were three-fourths. In fact, the swede was the least profitable root they could grow in many counties, and especially in the county of Cambridge; and was not to be depended upon with any confidence, however highly cultivated or favourable the circumstances. It ran up with a great neck, became diseased, rotted, and got worthless. What, then, should be a substitute? for it was an important matter for consideration. He himself had resorted largely to kohl rabi, and with a good deal of success. For five years he had been growing it, increasingly; and his opinion was that it was the most profitable crop upon the land, with the exception, perhaps, of mangel wurzel. It was excellent for transplantation after a green crop, such as tares or rye; the land should be well cleaned, and the manure put on in the autumn. In fact, he had planted not less than eleven acres of kohl rabi in the present year alone. He transplanted it as late as the third or fourth week of July, and it was as beautiful a crop as he could wish to see. His practice was to drill it partly on the regular summer fallows, just before drilling swede turnips, and the plants were in a capital state when tares, &c., were gone. There was not much certainty about a crop of turnips after tares. Once in five or six years they might succeed pretty well; but generally speaking they did not, whereas kohl rabi succeeded without a doubt. Being a hardy plant, it was difficult to kill, and for ewes and lambs it was as fine food as they could have in March and April. His hoggets were now doing well on that grown on the fallows. He would strongly recommend, therefore, that where the land was good for anything, kohl rabi should be substituted for the swede. He believed that it exhausted the soil something more than turnips did; but in such a year as the last it was of great advantage to him; for where he had grown turnips and fed them off with sheep the barley was all down and good for very little; but where the kohl rabi grew, it was stiffer in the straw, of much better quality, and worth £2 to £3 an acre more than any other barley that he had. The certainty of the crop, and a good return, were therefore compensatory for any little exhaustion of the soil.

Mr. J. **Bradshaw** (Knowle, Guildford) thought the comparative failure of mangel wurzel this year, instead of being a loss to the farmers, would ultimately be a great benefit, because it would teach them how to use that root, and make them better acquainted with its real value. It was a most interesting question what was the best period for the use of mangel wurzel? This year many persons had used it two months ago, and they were still using it. He was himself using half mangold and half swedes for bullocks, and never perhaps had his bullocks thriven so well before. It had been stated in effect that if mangold was given to cattle injudiciously they got into a scouring state. His bullocks exhibited no sign of scouring, and the best proof that there was no scouring was the laying on of fat. He believed that if mangel wurzel were properly used, it would in every stage prove an advantageous crop. Mr. Nesbit had made some remarks on the enlargement of roots by stimulating manures. He quite agreed with that gentleman that very stimulating manures were apt to increase the crop beyond the desirable point; but the question was how far they ought to go. The other day he gave his man instructions to employ seven cart-loads of well-manufactured manure, instead of ten, for wheat. If the season were favourable, ten would yield a fair remuneration, but if not seven was amply sufficient, as he learnt good by experience in the last year. They all knew that straw was a great carbon-producing substance. An ox must have introduced into his system a large amount of this substance, which was ejected from his stomach; and straw in filling the stomach conveyed a valuable substance and discharged a useful function. He found from experience that he could get into a bullock of about 100 stone, of 8lb. each, 12lbs. of straw chaff, either oat or barley straw, and 9lbs. of hay, that was 21lbs. per day (he was very correct in weighing), and with that he gave 68lbs. of roots. Now this was not theory, but practice. (Hear, hear). His bullocks would not receive an ounce of oilcake till January. On the first of January he would begin by giving them 3lbs. of cake, which would be continued daily during that month; in the next month the quantity would be 4lbs., and in the next 5lbs.; and he had no doubt that he would have very good beasts at the end of March. There were other matters, however, which required to be attended to. His animals were warm, they had good layers, they had plenty of ventilation, they were kept clean, and they were upon boards. The placing of animals on boards was not, he would remark, an invention of Mr. Mechi. Gentlemen who had travelled through Bavaria and other parts of the Continent must have discovered that it was no new thing to place animals on boards. All the points which he had just mentioned should be carefully attended to, as that would tend to the cheaper and speedier fattening of the animal.

Mr. **Walton** (Alton) said no one could have a higher opinion of mangold wurzel than he had for all descriptions of stock, having grown it for upwards of thirty years with great advantage. Living in a dry country, where there was great difficulty in growing swedes and turnips, he had sometimes been obliged to resort to mangold wurzel, previous to the lambing of his ewes, in January, and occasionally in December, also directly after the ewes had lambed; but he was of opinion that the special merit of mangold wurzel was, that it was available for late feeding, as it would keep longer than any other root.

Mr. **Joseph Payne** (Felmersham, Bedford) said he had always found mangold wurzel a very valuable crop. He never consumed it till after January; and growing enough generally to last till the spring, he found it better for his ewes and lambs than anything else. He never found it of much use in the fattening of cattle. He had tried it several times, but he found that if he gave them much they did not do well. As regarded straw, he believed the best use it could be put to was for beasts to lie upon. He thought it would pay better for litter, and make much more manure that way, than any other; if cut into chaff it would make less manure, and beast would get a worse article in the shape of food.

Mr. **Wells** wished to observe that, although he had been a considerable grower of mangold wurzel, he had not given any of it to sheep. As regarded cattle, it should be borne in mind that mangold wurzel contained an immense amount of water, and must therefore be used with care. He had suffered very much through giving his young stock mangold wurzel at the commencement of the season; in fact some of them had been paralyzed. He attached a great deal more value to straw than the gentleman who had just spoken. He fed from sixty to eighty bullocks every winter, and they never got any hay, except on the day preceding that on which they were sent to market. In addition to their roots and oilcake, they had a good forkfull of straw laid before them every night, which they picked over, when fresh thrashed, with great relish; in the morning the refuse went for bedding, and a fresh supply was given: and he thought his stock generally made as good an appearance as that of his neighbours. He could not, therefore, subscribe to the opinion that straw was of no value. He had tried the pulping of roots by hand on a small scale, which, when mixed with chaff or cut straw, so convinced him of the importance of pulping, that he was now making arrangements for pulping by steam-power. As regarded the growth of mangold wurzel, he felt certain that its chief use was as an auxiliary to other food, and that farmers would prove mistaken if they relied on it as a substitute. It should be remembered that mangold wurzel was a very exhausting crop.

The **Chairman** thought it desirable that Mr. Wells should state in what part of the kingdom he farmed. (Hear, hear.)

Mr. **Wells** said he farmed on the warped lands of Yorkshire, and also on the wolds of that county.

The **Chairman** said they were all aware that straw was of much greater value in the north of England than in the south.

Mr. **Stokes** said the question of the relative values of mangel wurzel and turnips was settled many years ago. The late Lord Spencer, while President of the Smithfield Club selected two oxen (he thought it was in the month of October), fed them alternately on mangel wurzel and turnips each for a month, and weighed them at the end of the month. The mangel wurzel and the turnips being given in the same proportions, the result was that the former yielded rather more weight than the latter.

The **Chairman** said before the discussion closed he wished to make one or two remarks. Mr. Nesbit observed that warmth was of very great influence in the fattening of stock. Now that opinion he was enabled to corroborate from his own experience. Having been a practical farmer for a considerable period, and been engaged in the fattening of bullocks year after year, he was satisfied that the keeping animals warm was a great saving of food. This brought him to a point for which he had often contended before, namely, that instead of exposing their beasts to the elements in great open yards, where they were half starved, they should have covered homesteads for them; and he thought farmers would act wisely in consenting to a certain per-centage of additional rent rather than forego that advantage. (Hear, hear.) As regarded the best period for using mangel wurzel there seemed to be a great difference of opinion. He himself commenced with mangel wurzel as soon as he got it up, believing that it contained more saccharine matter at that period than at any subsequent one. The great mistake which people made lay in the giving too much. It was the abuse, and not the use of it which had led to injury. He was now feeding every day tegs or lamb hogs on mangel wurzel mixed with swede turnips, and they did exceedingly well on that mixture. An allusion had been made to the difficulty of securing a crop of mangel. There was difficulty in securing any crop; but having been at the trouble and expense of producing it, they should not grudge the pains requisite to secure it. His practice in Bedfordshire for the last nine or ten years was to draw it together and clamp in the most convenient places; cover it first with loose straw, and well thatch it with haulm, or a mixture of wheat straw and stubble; secured in this way it will keep through the ensuing summer. What he requires for immediate use he only covers with loose straw; a portion, however, is left on the field for sheep in the spring, and this he puts into heaps, and covered in the same way as he does his swedes.

The proceedings terminated with votes of thanks to Mr. Nesbit and the Chairman.

THE NOVEMBER DISCUSSION: DODDER.

The Secretary has been favoured with the following communication from Mr. E. Ravenscroft, of Messrs. Peter Lawson and Co., Edinburgh, and Great George-street, London:

Dodder comprises a genus of plants *(Cuscuta)* or parasites twining and twisting in search of food round other plants, into whose stems it inserts its wicker-like roots, destroying the plants to which it is attached by appropriating to itself the sap which was intended for the use of its victim! A dodder is known in some districts by the very elegant name of "Devil's Guts," from the resemblance it has to small intestines. Popularly described, the clown dodder (*Cuscuta trifolii*) may be said to be a series of fleshy threads, or long worms twisted round the plant; but Professor Henslow's description is perhaps the best: he says it is like a "fine closely tangled, wet catgut," and he is right. In its economy it is like a polype, so that if cut into a thousand pieces, each piece goes on growing as if nothing had happened. Tearing it in bits therefore for the purpose of extirpation only aggravates the mischief. It is a vegetable Hydra.

It makes its appearance in circles, and destroys not only clover, but all kinds of vetetable life, and leaves the whole area black, as if a fire had happened on the ground. Dr. Lindley in his *Gardener's Chronicle* of 1843 gives a long account of it. It was supposed to have come over from Afghanistan with seed for trefoil. The dodder seed may be separated from that of the clover by sifting it through a No. 17 sieve.

The most effectual method of extirpation is to dig up the crop where dodder appears, so as to form a circle considerably beyond the patch on which it appears, and then burn the crop along with the pared soil. The *rationale* of this is, that as it is only an annual it will be killed if flowering is prevented. Therefore, in resorting to this mode of extirpation, it must be done before the flower has time to ripen into seed.

There are four species of *Cuscuta* found in this country, lthough forty or fifty are known to botanists. These are—. C. Europea (the greater dodder); 2. C. Epilimen (flax odder); 3. C. Epithymum (lesser dodder); 4. C. Trifolii clover dodder).

THE CLUB DINNER

Took place on Tuesday evening, in the Show week, at Radley's Hotel, when the attendance was quite up to the average of past years, nearly eighty members sitting down. The chair was taken by the Chairman of the year, Mr. John Thomas, of Bletsoe, and among those present were Mr. Alderman Mechi, Mr. H. Trethewy, Mr. Fisher Hobbs, Mr. Jonas Webb, Mr. James Wood, Mr. C. Stokes, Mr. W. Bennett, Mr. S. Skelton, Mr. Shearer, Mr. G. P. Tuxford, Mr. W. T. Tuxford, Mr. C. Howard, Mr. J. Buckley, Mr. Beale Browne, Mr. Congreve, Mr. Cressingham, Mr. Mitchell, Mr. Robinson (Clifton Pastures), Mr. James Thomas, Mr. G. Russell (Kent), Mr. B. Ward, Mr. E. Little, Mr. Thompson (Badminton), Mr. Goldhawk, Mr. Bradshaw, Mr. T. F. Wilson, Mr. M. Reynolds, Mr. Druce, Jun, Mr. Purser, Jun., Mr. Dobito, Mr. Harrison, Mr. Parkinson, Mr. Shotter, and Mr. H. Corbet. Mr. L. A. Coussmaker, of Westwood, Guildford, as Chairman elect, occupied the Vice Chair.

After the usual loyal and national toasts, the CHAIRMAN said he had now to propose the toast of the evening, namely, "Success to the Central Farmers' Club." From the report presented by the committee to the general meeting held that day, it appeared that the Club now comprised about 500 members, there having been an accession of 70 new members within the last year; and whether they considered the list of members or the state of the accounts, they had, he thought, every reason to be satisfied with the position of the institution. The gentleman who was to respond to the toast would no doubt enter more fully than would be becoming in him, on the subject of the condition and prospects of the Club. He would therefore at once propose "Success to the Club" (cheers).

Mr. SKELTON, in responding to the toast, said he supposed that the reason why that duty had been entrusted to him was that he was one of the oldest members of the Club, and he regretted that he was not better qualified to do justice to it. As regarded the report, to whose contents the Chairman expected him to allude in detail, he begged to say that it had only just been placed in his hands, and he had scarcely had time to read it, and all he could say, therefore, with respect to that document was, that it spoke in very favourable terms of the general condition of the Club. He need not impress upon them that a club which endeavoured to promote the interests of so important a body as the agriculturists of this country ought not only to exist, but to be well supported. He had not come there to flatter his brother-farmers, but he had felt for years that such a body of men ought, in local farmers' clubs, and in that central one, to have, as it were, foci, where information would be collected, and the interests of agriculturists promoted. He had long been of opinion that that Club was not so well supported by farmers as it ought to be. The mere fact that it was a Central Farmers' Club might well create a feeling that the list of members, instead of being confined to 500, ought to include thousands, with an income of proportionate amount. They ought to have a club-house of their own in London, where there would be every facility for the accommodation of farmers and the advancement of their interests. He should be glad to see local farmers' clubs considerably extended; he thought that not merely every county, but every district also, ought to have an association of that kind, and he hoped they would all endeavour to stir up their neighbours to assist in the formation or support of local clubs. One effect of that would be indirectly to enlarge the Central Club, because the influence brought into operation in the local clubs would naturally centre itself there. That club was called a Farmers' Club, and it was as such that he joined it, but the committee had no wish to shut out members of any other class who wished to belong to it. The promotion of the interests of farmers was indeed the main object, but they were glad of the accession and support of members of other classes of society. He had always been proud to see among them one of the landlords of England—he meant Lord Berners; and he regretted that the state of that nobleman's health had deprived them of his presence on that occasion. There was another class whose representatives he was always glad to see at such gatherings as that: he referred to the clergy. It was always delightful to see the clergy mixed up with the laity in a good cause, and he hoped to see many of them associating themselves with the Club. They had recently had a solemn instance of sudden death in the person of the Rev. Mr. James; and all whom he addressed would, he was sure, agree with him that they owed a tribute of respect to the memory of one who was a staunch supporter and most useful member of that Club. Again, they could not do without chemists and machinists, without such men as Professor Johnson, and Mr. Nesbit, Mr. Bullock Webster, Mr. Fowler, and others who had aided in the development of agriculture; and he hoped that such persons would continue to co-operate with practical farmers through the medium of that Club. He would also like to see the rising generation joining the Club, and giving the results of their observation and experience so far as they were matured in reference to agricultural subjects. This led him to the subject of monthly discussions. He believed that these formed one of the most useful features in the Club, circulated as they were among members who could not attend; but he would rejoice if in the ensuing year some fresh topics were introduced, and new blood was infused in the persons of those who were selected to open the discussion. He concluded by urging all present to endeavour in their several localities to enlist new members for the Club, with a view of making it a further and more complete representation of the agricultural body.

Mr. TRETHEWY said the toast he was about to propose was originally assigned to Lord Berners, but since they assembled in that room a letter from his lordship had been placed in the hands of the Chairman, in which he stated that indisposition rendered him unable to attend. He deeply regretted that circumstance. His lordship did not require any panegyric from him; but he could not help expressing his regret that they were deprived of the honour of his lordship's presence. He now came to his toast, which was "The health of their Chairman" (cheers). He should not have undertaken the duty of proposing that toast were it not that his personal knowledge of and acquaintance with the Chairman enabled him to speak with confidence respecting him. He felt that it was very important for them as a club that they should have at their head a practical man. In that respect they were peculiarly fortunate, then, for there was not a more thoroughly practical farmer in England than the gentleman who had presided over them during the last twelve months. So far as his qualifications as an agriculturist were concerned, he knew him to be specially fitted for the office of Chairman; while of his fitness for the ordinary qualifications of that post, all who had attended the meetings had seen ample proof during the past year. Without detaining them any longer, he would propose the toast, believing that all would concur in the sentiment which he had expressed.

The toast having been drunk with great cordiality,

The CHAIRMAN, in replying, said he felt great diffidence in accepting the office of chairman, and he was extremely glad to find that the manner in which he had discharged its duties had given satisfaction.

Mr. Alderman MECHI said he had been requested by the Chairman to propose, as a toast, "The Royal Agricultural the Society of England, the Highland Society of Scotland, and Irish Agricultural Improvement Society." They all knew that the proceedings of those associations had led to very great improvements in agriculture. In the Journals of those societies different men communicated their thoughts on agricultural topics, and while relating what was going on in their own country, they had sometimes a good deal of fault to find with what was going on elsewhere—one effect of this being to cause a little shame at first, and to stimulate improvement in the end. Moreover, the extension of railways had rendered it practicable for the members generally to attend the annual meetings, and the result was great improvement in agriculture, through farmers observing what was going on around them, and at the same time an improvement in trade, through the increased demand for machinery. He should connect the toast with the name of Mr. Fisher Hobbs, who had done so much for British agriculture, and who was a member of the Council of the Royal Agricultural Society of England. He had a great respect for that Society; but he must say that, like all other societies, it required to be stirred up now and then. Progress must now be the order of the day; and he would venture to suggest that the Royal Agricultural Society would do more good if the Council allowed a freer communication of its proceedings through the medium of the press. He was himself not always able to attend the meetings, and he would, in common, no doubt, with many others, feel great pleasure in reading a report of what had occurred: many good things were said that never reached the ears or eyes of agriculturists generally. He believed the press was quite prepared to afford the requisite information. It was, indeed, objected that a great deal of nonsense was talked at the meetings. That objection would apply equally to the House of Commons (laughter). The truth was that the gentlemen connected with the press took care not to report nonsense, for if they filled their papers with nonsense nobody would read them. He was glad that the Royal Agricultural Society had offered a large prize for an essay on the use of steam-power in cultivation, and had also decided upon giving rewards for other things, which might prove very advantageous to agriculture. There was one question to which he considered it especially desirable that the Council should speedily direct their attention; he referred to the possibility of economizing and returning to the land the enormous quantities of manure which were now wasted in the sewers. The expediency of offering a reward to chemists and others, for the devising of some means of securing for the land the enormous mass of fertilizing matter poured into the sewers, was, in his opinion, well worthy of consideration.

Mr. FISHER HOBBS, in responding to the toast, said he regretted that Lord Berners, a Vice-President of the Royal Agricultural Society, was not there to perform that duty. That society had perhaps been more successful during its minority—it came of age during the month of May last—than any society which had been formed in Europe within the memory of man. With but a moderate amount of income it had greatly advanced the science and practice of agriculture, and developed the resources of this country, both as regarded the improvement of the breeds of animals and as regarded the increased production of the soil. He felt persuaded, in fact, that it had done more good than any other body of a similar kind in this generation. During their minority they, no doubt, made some mistakes and endured some misfortunes; they were now of age, and he trusted that amid the dangers that were now taking place they would be enabled to steer clear of all difficulties, and that year by year they would be enabled to impart to the agricultural body, and through it to the community at large, great advantages in connection with the science and practice of agriculture. When they first commenced there was scarcely a chemist in England who could be trusted with the analysis of soils or with the investigation of the value of manures, whether in a liquid or a solid state; while as regarded the quality of the land, few of them knew what was its real value. Now, however, so much had been written and done in respect to the drainage of land, and the proper application of manures and of chemical and mechanical principles to agriculture, that the result must be exceedingly beneficial to the country. There was indeed no one branch of agricultural study, whether scientific or practical, which could as yet be considered perfect. They went on, however, from year to year with drainage and with the steam plough, which was undergoing almost daily improvements, and he hoped and trusted that, through the encouragement which was being given to it, they would see steam cultivation established. He thought the time had arrived when the advantages offered by the Royal Agricultural Society would be more appreciated than they had been, and when the society itself would in consequence receive increased support. Agriculturists had much to learn in the science of entomology, very little being known by them at present, with regard to the habits and characteristics of insects. They had a vast deal also to learn with regard to geology, botany, and other sciences connected with them. Then they stood in need of a much larger acquaintance with veterinary science. The practical farmers of this country were suffering very materially from the diseases which infested their herds and flocks; and he felt persuaded that if farmers generally would rally round the Royal Agricultural Society, it would be enabled to communicate an increased amount of information on that and other subjects with great benefit to them and to the community at large. One of the most important duties which the council had to perform at the present time was the election of a secretary. There was great competition for the office among men of first-rate abilities and qualifications. A committee which had been appointed to make the selection had chosen ten for final consideration. The election would take place on Wednesday; and without knowing, of course, on whom the choice would fall, he felt satisfied that the desire of every member of the council was that the best man should have the office. He did not believe there was a single man among the seventy-five members of the council who would dare to sacrifice his duty to his private feelings. If such a man were proved to exist, it would be for the members of the Society to erase his name, and substitute for it another. He would only say, further, in reference to that Society, that the members of the council, living as many of them did in the country, had devoted their time and expended their money freely in the cause of agriculture; and for the kind manner in which the toast had been proposed and received, he tendered his sincere thanks on their behalf. As regarded the other societies included in the toast, he could only say that he hoped their proceedings would continue to be conducted in the same spirit that they had been hitherto; in which case, he believed they would tend to bring about still further improvements in the exhibitions of stock and implements. In the year 1862 there would be a great gathering in the western part of the metropolis; and he hoped they would then see their neighbours the French coming among them, not to desolate the country, but to join with them in developing the arts of peace and promoting the civilization of the world (cheers).

Mr. Charles Howard, in proposing "The Smithfield Club," said that was a toast which could not fail to meet there with a cordial reception. That club had done a vast amount of good already, and was calculated to do a great deal more. It had now outgrown the building in which its shows had been held for some years past, and a movement had accordingly been set on foot with the view of securing a more eligible site. He would couple the toast with the name of a gentleman who was as fine a specimen of his class as any of the animals now being exhibited were of their classes respectively (laughter)—he meant Mr. Jonas Webb (cheers).

Mr. Jonas Webb said, as a retired steward of the Smithfield Club, he felt much pleasure in returning thanks for the toast. Mr. Howard had truly remarked that that club had outgrown the building in Baker-street. The committee which was appointed last year to find a better site had recommended what they considered to be a very good one, but six months longer had been allowed them to see if they could find a better. The satisfactory settlement of that question would, no doubt, afford great pleasure both to the members of the club and to the public. As regarded the show of this year, he believed it was a very good one, and he would recommend those who had not seen it to do so at once.

Mr. Shearer, on rising to propose "The Local Farmers' Clubs and Societies" said that toast was a very important one, seeing that it was local associations that led to the formation of the Royal Agricultural Society, the Smithfield Club, and even the Central Farmers' Club, Their usefulness could hardly be overrated. Scattered as they were through the country, they had probably done more to advance agriculture generally than even the central institution in London. The central club of course took the lead in discussing questions of interest to the agricultural community, but no one who was acquainted with the local clubs could deny that an immense amount of talent was displayed in their proceedings. This was especially the case in the Newcastle Club, the Botley Club, and the Chippenham Society. He rejoiced that the last named club was represented on that occasion by its Secretary Mr. Little, with whose name he begged to couple the toast.

Mr. Little, in responding, said the local clubs for which he had the honour of returning thanks had, he believed, done a great deal to assist the Royal Agricultural Society, and other institutions, in promoting the improvements of stock, and the better cultivation of the soil. He did not agree with Mr. Hobbs that nothing scarcely was known about the nature of the soil before the Royal Agricultural Society was formed, for he recollected reading a great many valuable publications on the subject prior to that period. As regarded the discussions in the local clubs he could not refrain from remarking that although there might not be as great a display of scientific knowledge as there often was at the meetings of the Central Club, yet the addresses were generally of a very practical and useful character (Hear, hear).

Mr. Beale Browne proposed "The health of Mr. Coussmaker," Vice-chairman of the day, and Chairman of the Club for the ensuing year. Having, he said, been a member of the Club for some years—he would remark, in passing, that it was under the auspices of his excellent friend the late Mr. James that he first became a member —and having always felt great interest in its proceedings, he could not help expressing his conviction that the success of the Club depended in a very great degree on the selection of the most suitable persons to fill the principal offices; and he believed that if they continued as careful as they had been for some years to select the most practical men to act as chairman and vice-chairman, there was every prospect of increased success. But there was another thing besides the selection of gentlemen to fill the chair which required the most careful consideration. In the case of a club like that, there were, it should be remembered, a great many persons watching its proceedings with jealous eyes; and hence they ought to select not mere talented men, but practical men intimately connected with agriculture to open the discussions. They did not want men who would deliver brilliant orations, but practical men, who would introduce the subject in the best manner, so as to promote useful discussion. If such men were obtained, the agricultural world, which watched their proceedings with interest, would acknowledge that the Club was composed altogether of a practical body of men, and it would obtain a further accession of members. He was glad to hear from Mr. Jonas Webb that there was some probability that the farming interest would not much longer be subjected to the disgrace of having the Smithfield Cattle Show held where it was at present; one result of this being that men who brought their animals to London at considerable expense, to exhibit them, were unable to obtain the requisite accommodation. There was another point connected with that topic to which he could not help adverting. Why should the Smithfield Club have only one show in the year? Why should England be behind Ireland in that respect. In Ireland there was a Spring cattle show, a remarkably fine exhibition, and he did not see why there should not be one in England. If the Club comprised fifteen or twenty thousand members, as it ought to do, there would of course be no difficulty in carrying out such a project. He really did not understand why one of the finest agricultural countries in the world could not have a cattle show in the Spring, which would afford foreigners an additional opportunity of selecting animals of the best breeds, and taking them to other parts of the globe. He should not be contented with having mentioned the subject there, but would endeavour to get the idea carried into effect.

Mr. Coussmaker, in responding, said: Not long ago there was a prevalent demand to have "the right man put in the right place." Now, he could not help thinking that the chair of an important club like that, numbering about five hundred members, ought to be occupied by a thoroughly practical man, and a man of good standing in the agricultural world, well known as such by all the more extensive farmers of the country. Now, he himself certainly did not come under that definition; he was an amateur, and nothing more. He had, however, taken very great interest in the pursuits of agriculture for several years; he was, to a certain extent, a practical man: he had had twenty years' experience in agriculture, and he had always had the interest of that club very much at heart. He was, in fact, one of the oldest members, having joined the Club a few months after its formation; and he had for several years been a member of the committee, in which capacity he had done his best to promote the interests of the Club. A wish having been expressed that he should take the chair, he could not shrink from a duty which he felt to be fairly imposed upon him. At the same time he felt his own incompetence, and must claim a large amount of indulgence at the hands of his brother-members. The first Committee meeting at which he should preside would take place in January; the chief business of which would be to decide upon the subjects for discussion during the year. He hoped that the list before the committee would be an extensive one; and he would urge upon the members the desirableness of sending in good practical subjects between that time and January, in order that the committee might have a sufficient range for selection, and that next year's topics might be such as would prove interesting to agriculturists in general (cheers).

Mr. **Stokes** said they were all aware of the great value of a good working committee in an association of that kind, and how much prosperity depended upon their labours. They were fortunate in having a committee who attended well to their duties; and he felt great pleasure in proposing as a toast, "The Committee of the Central Farmers' Club" (cheers).

Mr. W. **Bennett**, in responding, said it was due to the committee to say, that they had, at all events, done their best; that they had endeavoured to promote the interests of the Club in every possible way, and thereby to benefit the agricultural community in general. He thought that Club was calculated to do a much larger amount of good if it was properly supported. When he heard, as he sometimes did, the reproaches against the Club of not having done all that it aimed at, he replied with the question, "Will you assist us to do better?" It was often an advantage to be spoken against. Without a little opposition a Club like that might not excite so much interest. Opposition roused the spirits of its members, and induced them to make increased exertions on its behalf. He repeated, that a Club like that was calculated to do a much larger amount of good than it had been enabled to do hitherto; all that it needed for that purpose was support adequate to the importance of the objects it contemplated. One means of obtaining for it increased support had been adverted to by the last speaker, namely, the proposing to the committee good subjects for discussion. Occasionally, perhaps, they had been unhappy in their topics, or in the manner in which they were discussed, (they could not always be successful), and it was highly important, therefore, that efforts should now be made to secure a good selection of subjects for the ensuing year. Agricultural topics were second to none in the world in real practical interest. The best means of cultivating the soil and the development of its powers in the most successful manner, was a benefit not merely to those who were engaged in the work, but to the whole community—surely that was one of the most interesting and important questions to which the attention of rational and patriotic men could be directed It was well said by an eminent man of a past generation, that he who made two blades of grass grow where only one grew before, was a benefactor to his country; and although the occupation of a farmer was often looked down upon, he must say that the man who was successfully engaged in the cultivation of the soil was promoting the best interests of his country, and deserved the respect of his fellow-countrymen (cheers). These were pretty much the sentiments which actuated him and his late excellent brother, when at the formation of the Club some fifteen years ago, they consented to join it. He had a distinct recollection that, in talking over the matter at Bickerings Park, his brother said, "If, William, I thought the object was merely to form a central place of festivity, I would not join it. But I can conceive, that to meet a number of intelligent agricultural friends from different parts of the kingdom, and give our individual experience in farming, might be materially beneficial; it is, in fact, one of the most pleasurable things belonging to the farming business that we have no secrets (cheers). But in making communications we increase our own stock of information. I think a club of that kind might materially benefit agriculture, and through it the country at large." You thus see, gentlemen (continued Mr. Bennett), what were the objects of some of the early promoters of this Club; and he would hope that even so far great benefit had ensued, and doubtless by persevering efforts far greater would yet be attained. He hoped, in giving the foregoing remarks of his late excellent brother, he should not be misunderstood. For himself, he had no objection, occasionally, to a little good cheer; in fact, he thought it hard if, after upwards of three hundred days of fag and toil, and gloom, we, as farmers, may not have one bright day of sunshine in the course of the year (laughter and cheers).

Mr. **Wilson** proposed the health of the Secretary Mr. Corbet, in a highly complimentary speech.

Mr. **Corbet** returned thanks.

Mr. **Trethewy** proposed "The Press," and in doing so dwelt on the immense advantages the Club derived from the able reports of the proceedings given in the *Mark Lane Express*, and *Bell's Weekly Messenger*.

Mr. G. P. **Tuxford** briefly acknowledged the compliment.

Mr. **Reynolds** proposed the better health of Lord Berners, one of their oldest members, and most constant frequenters of this annual gathering. In company with some other members of the Club he (Mr. Reynolds) had recently experienced his Lordship's hospitality at Keythorpe, and could speak from this visit to the great and active interest taken by Lord Berners in the pursuits of agriculture.

The company having duly honoured the toast then broke up.

LORD TREDEGAR'S AGRICULTURAL SHOW.

This great exhibition of live farming stock—at which also many prizes are given for other matters connected with improvements in agriculture—took place during the second week in December, at Newport, commencing with a private view to the representatives of the press and a favoured few besides, on the Monday, and closing on the Wednesday. Rapid and wondrous as has been the progress in all departments of agriculture, the first and greatest of sciences and arts, the county of Monmouth has reason to be peculiarly proud of the improvement which has taken place in its agricultural system; for, fostered by the noble Lord's unremitting liberality, and answering that liberality by strenuous exertions, the farmers have struggled with and overcome many natural disadvantages of soil and position, and now rank in the A 1 class of cultivators and producers. Not that we are so servile as to say, or so foolish as to think, that this great result has been arrived at exclusively through the support of one individual, or one family, however influential or well-intentioned; but Lord Tredegar's interest in agriculture is not confined to offering the annual prizes initiated by his progenitor, for no branch of practical farming is exempt from private encouragement emanating from him. Yet all this good seed would have been fruitless had it fallen on barren soil, and it required the characteristic energy and perseverance of Britons, directed into a bucolic channel, and infused among many resolute men, to work that notable reform which has placed the agriculturists of Monmouthshire in their present high position. Not alone in the prize-lists of the national show do these men stand out conspicuous: the stranger traversing their district sees such admirable order and obvious care in the arrangements as he little expects, and finds that Nature, here geologically obstinate, has been mastered with great pains, but with corresponding success. No doubt here, as elsewhere, the premiums offered to the tenant farmers for best crops of roots have done much to promote this state of things, by stimulating and encouraging increased efforts in that most vital branch of farming operations.

LIST OF AWARDS.

Silver Cups given by Lord Tredegar:

For the best yearling bull, North Devon breed—Mr. James Merson, Brinsworthy, North Molton, Devon.

For the best two-years-old heifer, ditto—Mr. James Merson, Brimsworthy, North Molton, Devon.

For the best yearling bull, short-horned breed—John Logan, Esq., Maindee, near Newport.

For the best two-years-old heifer, ditto—Mr. John Lane, Barton Mill, Cirencester. John Logan, Esq., Maindee, highly commended.

For the best yearling bull, Hereford breed—Mr. Rees Keene, Pencreeg, near Usk.

For the best two-years-old heifer, ditto, Mr. John Hewer, Vern House, near Hereford.

For the best fat ox that has never won a prize—Mr. J. Jones, Llwyngaer. M. H. Crawshay, Oakley Park, Newnham, highly commended.

For the best boar—Mr. John Llewellyn, Caerphilly, Glamorganshire.

For the best Fat Pig—Mr. W. Stock, Pillgwenlly, Newport.

For the best ram lamb, long wool—Mr. John Lane, Barton Mill, Cirencester.

For the best ram lamb, short wool—Mr. John Moore, Littlecott Farm, Wiltshire,

For the best yearling cart colt or filly, bred by the exhibitor—Mr. John Benjamin, Shirenewton, Chepstow, Mr. Thomas Ford, Whitston House, commended.

The following Silver Cups given by other Gentlemen :

Capel Hanbury Leigh, Esq., Pontypool Park.—A Cup for the best yearling heifer, bred by the exhibitor—John Logan, Esq., Maindee, near Newport.

William Mark Wood, Esq.—A Cup, value five guineas, for the second best ditto—Mr. Henry Hale, Troston Farm, Christchurch. Mr. E. Francis, Goldcliffe, commended.

Colonel Lascelles.—A Cup for the best Glamorganshire fat cow—Mr. William Powell, Eglwys-inon, Glamorganshire.

Willam H. M. Style, Esq.—A Cup for the best fat cow—Mr. W. Powell, Eglwys-inon, Glamorganshire. Mr. M. Hale, Cold Harbour, Nash, commended.

Thomas Powell, Esq., The Gear.—A Piece of Plate, value ten guineas, for the three best cows in milk, or within three months of calving—Mr. Warren Evans, Llandowlais.

James Rennie, Esq., Maindee.—A Piece of Plate for the best pair of two years-old heifers, in milk, or within three months of calving—Mr. Rees Keene, Pencraig, near Usk. Mr. Warren Evans, Llandowlais, highly commended.

Frederick Justice, Esq., Belle Vue.—A Cup for the best pair of yearling steers—Mr. Rees Keene, Pencraig, near Usk. Class commended.

Samuel Homfray, Esq., Glen Usk.—A Cup for the best two-year-old heifer, bred by the exhibitor—Mr. R. Williams, Brecon. Lord Tredegar; Mr. Lane, Cirencester; and Mr. Hewer, Hereford, highly commended.

D. R. Williamson, Esq., The Lawes, Perthshire.—A Cup for the second best yearling bull, shorthorned breed—Rev. W. H. Beever, Cowbridge. Lord Tredegar and John Logan, Esq., Maindee, commended.

William Phillips, Esq. Whitston House.—A Piece of Plate, value ten guineas, for the best bull, under two years old—Mr. Charles Hale, Tatton Farm, Nash, near Newport.

The Mayor and Members of the Corporation of Newport.—A Silver Salver, value twenty guineas, for the horned beast of any breed amongst those exhibited for prizes at the show, which shall, in the opinion of the judges, be entitled to the most merit—Mr. Henry Higgins, The Grange, near Lydney, Hereford. Mr. Rees Keene, Pencraig, highly commended.

The Right Hon. Lord Llanover.—A Cup for the best ram, any Welsh mountain breed.—Mr. John Fothergill, Cefnruchtir.

The Lady Llanover, Llanover Court.—A Cup, value five guineas, for the best pen of six breeding ewes any Welsh mountain breed—Mr. John Richards, Spitty Farm, near Abergavenny.

Captain George Homfray, Newport.—A Cup, value five guineas, for the best pen of four mountain wethers—The Ebbw Vale Iron Company, Abersychan.

Octavius Morgan, Esq., M.P., The Friars.—A Cup for the best boar and sow, of any breed, under a year old—Mr. John Llewellyn, Caerphilly, Glamorganshire.

W. P. Herrick, Esq., Beau Manor Park, Loughborough, Leicestershire.—A Cup, value five guineas, for the best boar under two years old, and two sows, its offspring, under nine months old, store order—Mr. Thomas Baker, Wilcrick, near Newport.

Thomas Gratrex, Esq., King's Hill.—A Cup for the best two-years-old cart colt or filly—Mr. Thomas Harrhy, Llanversan, near Cardiff. Mr. C. J. David, St. Mellons, commended.

John Logan, Esq., The Maindee.—A Cup, value five guineas, for the best three-years-old cart colt or filly—Mr. J. Davies, Llanllecha Farm, Christchurch.

Colonel Poulett Somerset, M.P.—A Cup for the best cart stallion—Mr. Perkins, Mathern, near Chepstow. Mr. J. Farr, Merdy Farm, Langstone, commended.

John E. Rolls, Esq., The Hendre.—A Cup for the best pony, under four years old—Mr. W. Williams, Red House, Ely. Mr. T. Thomas, St. Hilary, Glamorgan, highly commended.

J. P. Gwynne Halford, Esq., Buckland, Breconshire.—A Cup for the best yearling colt or filly, got by a thorough-bred horse, and bred in Monmouthshire, Glamorganshire, or Breconshire—Mr. R. L. Williams, Felin Newydd, Hay. Mr. R. Thomas, Crwys Farm, Cardiff, highly commended.

The Hon. Godfrey Charles Morgan, M.P.—A Cup for the best three-years-old colt or filly, got by a thorough-bred horse and bred in Monmouth, Glamorgan, or Brecon—Mr. W. M. Watson, near Bridgend. Mr. T. Thomas, St. Hilary, Glamorganshire, commended.

E. M. Currie, Esq., Itton Court.—A Cup, value five guineas, for the best four-years-old colt, filly, or gelding, got by a thorough-bred horse, foaled and bred in the county of Monmouth—Mr. Rees Keene, Pencreig, near Usk.

G. R. Greenrow Relph, Esq., Beech Hill, near Usk.—A Cup, value ten guineas, for the entire horse calculated to produce the best stock, for road or field—Mr. R. L. Williams, Felin Newydd, near Hay.

W. S. Cartwright, Esq., Newport.—A Cup, value ten guineas, for the best thorough-bred entire colt, two-years-old or upwards, bred by, and the property of an exhibitor—J. P. Gwynne Holford, Esq., Buckland, Breconshire.

Charles Croft Williams, Esq., Roath Court.—A premium of five pounds to the exhibitor of the best and most useful implements in agriculture. Also a premium of two pounds for the second best ditto: 1st prize, Mr. J. S. Stone, implement manufacturer, Newport; 2nd, Mr. J. S. Stone.

Crawshay Bailey, Esq., M.P.—A Cup, value ten guineas, to the tenant farmer in Monmouthshire, for the best root-crop. consisting of mangold-wurzel and Swedish or common turnip, in all not less than fifteen acres—Mr. William Price, Bishton. Mr. W. Parker, Green-lane Farm, Caerwent, highly commended. Mr. W. Cadle, Llancayo, near Usk, and Mr. Rees Keene, Pencraig, commended.

George Rollings, Esq., Llanarthan.—A Cup, value five pounds, to the tenant farmer for the best cultivated farm, in the parishes of Rhymney, Saint Mellons, Marshfield, Peterstone, Saint Bride's, or Coedkernew—Mr. Thomas Baker, Coedkernew.

Prizes given by the Gentlemen of Newport and the Neighbourhood.

Piece of plate, value ten guineas, for the best, and a piece of plate, value five guineas, for the second best bull, cow, and offspring; 1st prize, Mr. Warren Evans, Llandowlais; 2nd, Mr. G. Pritchard, Llanfihangel.

Piece of plate, value ten guineas, for the best, and a piece of plate, value five guineas, for the second best fat cow; 1st prize, Mr. R. Keene, Pencraig; 2nd, Mr. H. Higgins, The Grange, near Lydney.

Piece of plate, value ten guineas, for the two best fat cows fed in the county of Monmouth; Mr. W. Evans, Llandowlais. Commended: Mr. Thos. Edwards, Llanarth.

Piece of plate, value five guineas, for the two best fat cows fed on the levels of Caldicot or Wentloog; Mr. Henry Hale, Troston Farm, Christchurch.

Piece of plate, value ten guineas, for the best, and a piece of plate, value five guineas, for the second best pair of two-year-old steers; 1st prize, Mrs. S. Lewis, Park Farm, Llangibby; 2nd, Mr. Evans, Llandowlais.

Piece of plate, value five guineas, for the best pair of yearling steers, bred and fed by the exhibitor; Mr. H. Higgins, The Grange, near Lydney. Commended: Mr. Rees Keene, Pencraig.

Piece of plate, value ten guineas, for the best, and a piece of plate, value five guineas, for the second best pair of yearling stock heifers; 1st prize, Mr. H. Higgins, The Grange, Lydney; 2nd, Mr. J. Jones, Llwyngaer.

Piece of plate, value five guineas, for the best pen, consisting of four yearling wethers, long wool; Mr. Rchd. Phillpotts, Pwlmeyrick, near Chepstow.

Piece of plate, value five guineas, for the best pen, consisting of four yearling stock ewes, long wool; Mrs. Elizabeth Dew, Abergavenny.

Piece of plate, value five guineas, for the best pen, consisting of four breeding ewes, under three years old; Mr. J. Jones, Llwyngaer, near Raglan.

Piece of plate, value five guineas, for the best pen, consisting of four breeding ewes, above three years old; Mr. J. Jones, Llwyngaer, near Raglan.

Piece of plate, value ten guineas, for the best piece, not being less than ten acres, of Swedish turnips, growing within the county of Monmouth; Mr. William Price, Bishton. Highly commended: Mr. William Cadle, Llancayo, near Usk.

Piece of plate, value five guineas, for the best piece, not being less than five acres, of Swedish turnips, grown by a tenant farmer, in the county of Monmouth, who does not farm more than 100 acres of arable land; Mr. Henry Workman, Coedkernew.

Piece of plate, value five guineas, for the best piece, not less than two acres, of mangold wurtzel, grown by a tenant farmer in the county of Monmouth; Mr. Davis, Langstone Court. Highly commended: Mr. Workman, Coedkernew. Commended: Mr. Parker, Caerwent.

Premium of two guineas and a-half, for farm servants or labourers, for the longest servitude, uninterruptedly, under the same master, on the same farm, or under the same family; William Jones, servant to Mr. Rees Keene, Pencraig, 38 years.

A second premium of one guinea and a-half, ditto; John Smith, servant to Mr. George Pritchard, Llanfihangel, 35 years.

A third premium of one guinea ditto; Richard Samuel, servant to W. T. Rees, Esq., Holly House, 23 years.

Judges for the Horned Stock, Sheep, and Pigs.—Mr. T. S. Bradstock, Cobrey Park, Walford, near Ross, and Mr. T. Morris, Maisemore, near Gloucester.

Judges for Horses.—Mr. N. Skipp, Ross, assisted by Mr. J. Morgan, Ross.

THE DINNER

took place on Tuesday evening, at the King's Head Hotel. Lord Tredegar occupied the presidential chair.

After the usual loyal toasts were given and responded to,

The Chairman gave "The Lord-Lieutenant," followed by "The Members for the county" (cheers).

Mr. O. Morgan, M.P., said he had attended these meetings for more than thirty years with only two intermissions, and it was a great pleasure to him and all his family to see the increase in the institution since it was started on a small scale at Court-y-bella. The hon. Member noticed the gradual rise and sure progress up to the present time, and pointed to its good effects as visible in the improved farming of the district, especially in the rearing of live stock. He alluded to the scarcity of labour recently experienced, and which improvements in agricultural machinery were in a measure to counteract, as they enabled the same number of labourers to do a great deal more work, and so left more hands available for the defence of the country.

Mr. Crawshay Bailey, M.P., responded to the toast of "The Member for the Boroughs." He said agricultural progress must go forward. We were paying 20 millions a-year for corn to come into the country, and we must make further improvements. He recalled the time when the labourers were alarmed at the introduction of threshing machines, and now it was only at the top of some of the hills that they could get labourers to thresh with a flail, which was quite discarded in the valleys. He wished to see a prize offered at Newport for the best steam-plough, and he would be happy to subscribe towards a £100 premium for that purpose. Agriculturists must keep their fields clean from weeds, and he was surprised to find in a book he had been reading, that there were as many as 50,000 seeds in one plant, and in most of them 3,000 seeds. Unless they keep their land clean, how could they separate weeds from grain? When they bought a pound of clover, perhaps half of it was the seed of weeds, and only a microscope would find them out. About Ross the land and the farming were so good, that it had been said that a man might sit in his arm-chair and grow rich—but that must have been when wheat was 100s. per quarter, and they would never see those times again. He wanted to see the steam-plough, the harrows behind the plough, and the drill behind the harrows, so that the corn might be put in at one working. No doubt that would be done before long. Labour was getting scarce, and our colonies could take every man in the country: there was plenty of room for the whole 20 millions. Agriculturists should most certainly encourage the cottagers. There was a time when he thought the population was getting too thick upon the ground, and that kept him from marrying for about 20 years (great laughter); but now he wished he had 20 children, though, not being like the Mohammedans or the Grand Turk, he was only allowed to have one wife. He begged the agriculturists to give premiums for the best cottage gardens in every parish, for the best hive of honey, the cleanest cottage, the best pig in the stye. The hon. Member praised the superior physique of the agriculturists in language more emphatic than complimentary, for he said the mothers had plenty of milk, and therefore the children grew up "like calves." He concluded by proposing the health of Lord Tredegar, their noble President, to whom he paid a graceful compliment.

The toast was drunk with long-continued and hearty applause.

Lord Tredegar, in reply, expressed his intense gratification at the continued and increasing prosperity of the society. Although he did not know much about agriculture, it was his great amusement, and he took much interest in it; he was delighted when he saw good stock produced, or good implements brought forward. There was a difficulty in getting sufficient agricultural labour; and what with volunteers to the army and emigration, they must mainly rely upon the useful implements to keep up the growth of corn required for the support of the inhabitants of the country. The exhibition he had been so pleased to see that day was superior, in both numbers and quality, to anything he had seen before, and good judges had expressed a similar opinion. He tendered his best thanks to them all, and especially to those gentlemen of Newport and elsewhere who so largely contributed to the prize-list.

The President proposed "The Judges," and said he did not complain of their awards, although they had given the palm to Herefords, while he showed shorthorns.

Mr. T. S. Bradstock responded, and said he was surprised to see the improvement in the show since he saw it five or six years ago. He assured the president that, though a Hereford man, he went into the show-yard quite free from prejudice. Mr. Bradstock, whose remarks were partially inaudible to us, went on to notice a speech made by Mr. Relph at the recent Abergavenny agricultural meeting. Mr. Relph disagreed with Mr. Octavius Morgan, and said "he did not like rewarding labourers for getting a good number of children and then keeping them off the parish." He would like to know whether Mr. Relph would wish that men should desert their families, and leave them chargeable to the parish? The man who reared a family, and brought them to share in the industry of the country, was a national benefactor, and an increase of population was a part of our national wealth and greatness. To reward labourers in the manner mentioned by Mr. Crawshay Bailey was far better than to teach them to jump long and short, and such things as were advocated by Mr. Relph. He imagined if the noble lord in the chair were to go and find his tenantry so employed, he would consider it time to increase their rents. Mr. Relph said, "not one-half the farmers in the country were worth putting up good buildings for." He knew what it was to be a tenant farmer; and he would advise a landlord who had a tenant who was not worth putting up good buildings for, to give him notice to quit, and decline to keep him on the estate. Mr. Relph advocated the plan of letting farms by tender; but Mr. Bradstock said he hoped the time was far distant when such a practice would become general —that would crush the power and influence of the landed proprietary.

The PRESIDENT thanked Mr. Bradstock for his excellent speech, and said he quite coincided with every word of it. He hoped that as long as he lived he should see the same tenants as had lived on the estates for generations, and he should never encourage a spirit of change.

The PRESIDENT proposed the health of Lord Llanover, who, as well as his lady, gave prizes to the show. Himself and Lord Llanover were boys together; and he hoped they would always continue to be as good friends as they ever had been.

Lord LLANOVER, who was heartily received, in returning thanks, said his noble friend had alluded to the time when he first gave a cup to that institution. He believed he had the pleasure of being at Tredegar, under the roof of the present patron's father, when the cattle show was first established. It was his great pleasure in his younger days to offer a prize, which he had since had the happiness to continue year after year. The late Sir Charles Morgan at that time determined upon establishing this show for the purpose of advancing the agricultural interest of the county, at a time when shows of this description were few and rare; and it was partly owing to this good example that many of those societies were started which now exist and flourish throughout the kingdom, and which have done so much good to that interest with which they were all connected. Reverting to old days, he could not forget the time when the chair now occupied by his noble friend—and which, he trusted, would long continue to be so occupied—was filled by one whom they all cared for, and who was lovedaand respected by all who knew him. He, especially, when a boy, had many instances of his kindness; and in after life, at the festive board, on occasions similar to the present, had frequently the happiness of proposing his health. And although this institution was now carried on with vigour, with interest, with cordiality, and with every desire to promote its objects, by his noble friend, they must not forget by whom it was instituted, by whom it was originally framed. He was sure Lord Tredegar would forgive him if at this moment, instead of proposing a toast, he submitted to them a sentiment. It was one in which they would all join: mourning, perhaps, at not having the presence of him whose name he would not now mention, but respecting the memory of that man, to whom many of them were indebted for kindnesses. He proposed that they should drink to the memory of that good man who started this institution, but who was now no longer with them. [The sentiment was received and honoured with befitting solemnity.]

The health of "The Exhibitors," proposed from the Chair was acknowledged.

Mr. H. HIGGINS, after speaking most flatteringly of the show, went on to say that the one denomination of stock deficient was the pig tribe, which he could not account for. It was nineteen years since he had the honour of taking the first premium at this society, but he never saw such a good lot of animals there as was exhibited this time. Mr. Higgins went on to thank Mr. Bradstock for canvassing the speech of Mr. Relph. After reading Mr. Relph's speeches, knowing his brilliant talent and great power of speech, he did feel regret and surprise that he did not employ those talents in a more profitable way than in denouncing the poor farmers of the county of Monmouth, who had to struggle against difficulties almost insurmountable. Had Mr. Relph stated the whole of the facts, he would not have been inclined to say much about it; but when he denounced the farmers as unworthy the encouragement of their landlords, and not worth effecting improvements for, he should have said at the same time that a large portion of the land in the county of Monmouth was so sterile, the climate and formation so bad, that it was not worth the notice of a man of capital and skill to work it. That would have been putting the matter on a fair footing. He was sure they would agree with him that there were men occupying that description of soil in the county, many of whom were not better off than labouring men (Hear). If Mr. Relph had looked round the county, and taken notice of its cultivation and stock, he could not have made such unkind, uncharitable, unjust, and certainly uncalled-for remarks. Then Mr. Relph would quarrel with them for giving premiums to their agricultural labourers; but they would agree that they had not got too many labourers, and the army, the police, and other necessary public bodies drew many good men away from them. Another of Mr. Relph's notions was more amusing than instructive; he recommended their young labourers to be taught running and jumping—he supposed they would have a "jumping corps" after a bit. His idea was, that the labourer should be taught discipline rather than jumping, and to effect that object military training would be best. The last shaft sped by Mr. Relph was broad and wide; it was to recommend the system of letting farms by tender. He hoped the day was far distant when that system would be adopted. Mr. Higgins then read the following extract:—

"THE DUKE OF RICHMOND AND HIS TENANTRY.—The annual show and dinner of the tenantry on the Duke of Richmond's estates, in Banff, Aberdeen, and Morayshire, took place at Huntley on Thursday. In acknowledging the toast of his health, the Duke of Richmond said: When he read that farms were put up to public competition, and proprietors at the same time not binding themselves to take the highest offer—thus making the old tenant give a higher rent than the farm was really worth—he considered it to be double injustice: unjust to the tenant whose rent was thus screwed up, and unjust to the highest offerer, who did not get the farm. For himself he should have been ashamed of such conduct, and rather than be guilty of it he would break stones upon the streets of London. As a landlord he was entitled to a fair rent for his land, and if a farmer did not exert himself to take the full value of it, he had himself to blame. If the tenant refused to give a fair rent, he (the duke) had a right to try and get a fair rent for his land by letting it to another. A landlord owed much to his tenantry, and when they were industrious and enterprising they were better than any strangers that might be brought in by offering a high rent. He assured them that in looking round the table he liked much better to see old faces than new (applause)."

He wished that speech were printed in golden letters, and hung up in every land-agent's office in England. He hoped they would never see such a radical and great change.

A number of other toasts followed, principally of a personal nature, before Lord Tredegar left the room.

GUILDFORD CATTLE, CORN, AND ROOT SHOW.

The seventh annual exhibition in connection with this association took place on Tuesday, Dec. 13. This year's show fully sustained the reputation which it has won at former meetings. The entries in most departments were numerous, and, as a whole, quite equal in character to those of any previous exhibitions. There was a slight falling off in the number of store stock, and the show of corn was not extensive; but, altogether, the exhibition was of a most satisfactory nature.

The collection of fat beasts was remarkably fine, some of the animals exciting much attention and approval. Amongst these we may mention as worthy of very particular notice a three years and nine months old Devon steer, belonging to Mr. Hy. Shotter, of Slades, Bramley, which took the first prize of £5 in Class 2, and also the silver cup given by Mr. Thynne.

In the department devoted to lean stock there were various animals of great merit. That shown by Mr. Arthur Lambert, of Ockham, was especially fine, and deservedly carried off Mr. Currie's silver cup (of the value of 5 guineas), as well as the President's gift of £2 for the best pure-bred beast, shown as lean stock, and bred by the exhibitor.

The show of fat sheep called forth very great approbation, some beautiful animals being exhibited by Mr. Murray Marshall and Mr. John Ellis, who, between them, carried all the awards, save one. The former gentleman obtained Mr. Guildford Onslow's silver cup (value £5 5s.), for the best pen of Southdown sheep; and also the first prize of £4, by his contribution of five animals fed on hay, cabbage, roots, and cake, and bred by himself. The sheep entered in Class 1 was allotted the silver cup (worth £5 5s.), presented by Mr. Bovill, for the best pen of Down wether sheep exhibited by a tenant farmer occupying less than 150 acres of land.

The exhibition of pigs was of a first-rate description, and contained a number of exceedingly creditable specimens. One particularly attracted universal attention, and was the fortunate possessor of no less than three prizes. This animal was shown by Mr. Frederick Bowyer, of Stoke Mill, Guildford.

The horse show was decidedly superior to that of any former year, and several of the entries were in first-rate condition.

The department allotted to the exhibition of roots, however, was that which gave to this year's show its great merit. The mangel wurzels and globe wurzels were remarkably large and fine, and the whole of the latter were especially commended by the judges. There was a very extensive collection of Swedes and turnips, of first-rate character, and the cabbages were also deserving of much commendation.

There was a large and superior assortment of agricultural and other implements, some of which were of a novel and improved description. Messrs. Filmer and Mason, of Guildford, exhibited an extensive collection. Mr. F. Apted, of Guildford, showed a root mincer, of Wood's; Mr. Thomas Gill, of Guildford, several chaff cutters, chain harrows, &c.; Mr. James Woodbourne, of Kingsley, Hants, had on view improved ploughs; Mr. Charles Bushnell, of Pitch-place, Guildford, showed a winnowing machine and a turnip drill; and Mr. J. Stedman, of Ash and Normandy, exhibited several chain harrows.

The judges were:—Of fat and lean cattle, sheep and pigs—Mr. Thomas Wells, Phenill Farm, Dorking; Mr. William Challen, Wisborough-green, Sussex; and Mr. W. Haydon, Tulse-hill, Brixton. Of horses, roots, and corn—Mr. T. B. Lacoste, Chertsey; Mr. William Smithers, Sondes, Dorking; and Mr. William Cousens, Nore Farm, Godalming.

The following is the list of awards:—

FAT BEASTS.

Fat Oxen or Steers without restriction as to age—£5 to Mr. William Simmonds; 2nd, £3 to Mr. Henry Shotter.

Fat Steers under four years of age—£5 to Mr. Henry Shotter; 2nd, £3 to Mr. John Ellis; 3rd, £1 to Mr. John Hooker. Highly commended, Mr. James Elstone.

Fat Heifers under three years of age—£3 to Mr. John Ellis; 2nd, £1 10s. to Mr. William Taylor, jun.

EXTRA PRIZES.

A Silver Cup, the gift of F. G. Thynne, Esq., for the best fat ox, steer, or heifer, in the show yard, Mr. Henry Shotter.

A prize of £3, the gift of Mr. John Ellis, for the best fat steer under four years old, bred by the exhibiter, to Mr. John Ellis.

A prize of £2 2s., the gift of Mr. John Wilson, for the best fat heifer, bred by the exhibiter, to Mr. John Ellis.

SHEEP.

Fat Down Wether Sheep under two years old—£4 to Mr. Murray Marshall; 2nd, £2 to Mr. Murray Marshall; 3rd, £1 to Mr. John Ellis. Highly commended, Mr. John Ellis.

Down Maiden Ewes under two years old—£2 to Mr. John Ellis.

Down Ewes which have reared a lamb the present year—£2 to Mr. Murray Marshall.

EXTRA PRIZES.

A Silver Cup, value £5 5s., the gift of Guildford Onslow, Esq., M.P., for the best pen of Southdown Sheep, Mr. Murray Marshall.

A Silver Cup, value £5 5s., the gift of W. Bovill, Esq., M.P., for the best pen of Down Wether Sheep, exhibited by a tenant farmer occupying less than 150 acres of land, to Mr. R. B. Baker.

FAT PIGS.

Fat Pigs of any age—£2 to Mr. William Whitbourn; 2nd £1 to Mr. William Whitbourn. Highly commended, Mr Henry Cox and Mr. W. Eager.

Fat Pigs under 12 months old—£2 to Mr. Frederick Bowyer; 2nd, £1 to Mr. Henry Cox; 3rd, 10s. to Mr. Henry Cox.

EXTRA PRIZES.

A prize of £1, the gift of Mr. William Simmonds, for the best Fat Pig of best quality, shown in either class (bred by the exhibitor), to Mr. Frederick Bowyer.

No. 2.—A prize of 10s., the gift of Mr. Richard Mason, for the best fat pig under 10 months old (bred by exhibitor) to Mr. Frederick Bowyer.

LEAN STOCK.

Bulls under three years old—£3 to Mr. John Ellis; 2nd, £2 to Mr. J. F. Burrell.

Bulls under two years old—First prize a silver cup, value £5 5s., the annual gift of H. Currie, Esq., to Mr. Arthur Lambert; 2nd, £2 (by the association), to Mr. James Rhodes. Highly commended, Mr. William Taylor, jun.

Bulls under 12 months old—1st to Mr. John Ellis: 2nd to Mr. William Taylor, jun.

A prize of £3, the gift of J. Rhodes, Esq., Seale, for the best pure-bred Cow and offspring of the present year, to Mr. James Rhodes. Highly commended, Mr. John Ellis.

HEIFERS.

Heifers under three years of age, in calf or with calf at foot—£3 to Mr. James Rhodes; 2nd, £1 10s. to Mr. James Rhodes.

Heifers under two years of age—£3, the gift of J. F. Burrell, Esq., Frimley, to Mr. John Ellis; 2nd, £2 to Mr. Murray Marshall.

EXTRA PRIZE OF £2,

The gift of the President, R. D. Mangles, Esq., for the best pure-bred beast of any description, shown as lean stock in the foregoing classes, and bred by the exhibitor, to Mr. Arthur, Lambert, Ockham.

STORE SHEEP.

Down Ewe Lambs, under 12 months old, bred by the exhibitor—£3, the gift of Murray Marshall, Esq., to Mr. J. F. Burrell; 2nd, £2 to Mr. Murray Marshall.

STORE PIGS.

Boars under 12 months old—£2 to Mr. John Ellis; 2nd, £1 to Mr. Edward Hilder.

Breeding Sows—£2 to Mr. Wm. Tickner, Brockham Court Lodge; 2nd, £1 to Mr. Henry Cox, Boxgrove.

HORSES.

Cart Stallions of any age—£3 to Mr. Goodchild, Normandy. Highly commended, Mr. W. E. Elkins.

Cart Stallions under four years old—£3 to Mr. Butler, Tilsey.

Cart Colts under three years old—£3, the gift of H. Drummond, Esq., M.P., to Mr. W. E. Elkins; 2nd, £2 to Mr. J. Ellis. Highly commended, Mr. J. F. Burrell.

Cart Colts under two years old—£2 to Mr. Arthur Lambert; 2nd, £1 to Mr. A. Lambert.

Cart Mares and Foals—£2 2s., the gift of Mr. E. Hilder, to Mr. S. Stronghill; 2nd, £1 10s. (by the Association) to Mr. F. G. Thynne. Highly commended, Mr. N. W. Butler.

ROOTS.

Mangold Wurzel of the Long Variety—£2 to Mr. William Drewitt; 2nd, £1 to Mr. Edward Hilder; 3rd, 10s. to Mr. Thos. Drewitt. Highly commended, Mr. Butler.

Globe Wurzel—2*l.* to Mr. Daniel Hooker; 2nd, 1*l.* to Mr. W. Eager; 3rd, 10s. to Mr. Henry Greenfield. Highly commended, the whole class.

Swede Turnips—2*l.* to Mr. J. F. Burrell; 2nd, 1*l.* to Mr. Thomas Baker; 3rd, 10s. to Mr. Thos. Bradshaw.

Yellow Turnips or Hybrids—1*l.* to Mr. W. E. Elkins.

White Turnips—2*l.* to Mr. Mark King; 2nd, 1*l*, to Mr. Geo. Thompson; 3rd, 10s. to Mr. James Franks.

The best sample of any other vegetable produce suitable for Agricultural Purposes—1*l.* 5s., the gift of J. I. Briscoe, Esq., M.P., to Mr. Wm. Churchman.

CATTLE DISEASE IN THE COLONIES.—The latest papers from Victoria notice that "a disease supposed to be pleuro-pneumonia has made its appearance in one of our colonial herds." The *Victoria Agricultural and Horticultural Gazette* states that Master Butterfly suffered from a cold and a husky cough soon after he landed; that he gradually lost condition, and seemed to decline from the effects of a pneumonic disease, very similar to pulmonary consumption in the human frame. The same journal goes on to say that:

> "This is not by any means the only case of the kind that has occurred; many valuable imported animals have fallen victims to the same disease, some suffering and lingering

longer than others; nor is it confined to imported stock, although from the manner in which these are reared, and from the sudden changes of temperature, with perhaps badly ventilated boxes on shipboard, to which they are subjected during the voyage out, they are much more liable to attacks of cold than the animals reared among ourselves, or in the adjacent colonies. We believe that due attention is not paid to the animals on board ship, nor after landing. By this we do not mean that they are half-starved, or half-cleaned; but that due consideration is not paid to guard them from the vicissitudes of the weather, and that on board ship, or immediately after landing, is laid the foundation of that disease, that in the course of a very short time renders them useless, and ultimately carries them off. We hope, therefore, that much more attention will be paid to this important branch of the management of cattle, and that we shall not have to lament the premature loss of so many valuable animals, as have died from this cause already."

A meeting of the stockholders was held in Melbourne in the middle of September, when the following resolutions were passed:—

"That on hearing the reports of the committee and of the veterinary surgeon appointed to inspect the diseased herd, it is the opinion of this meeting that the disease in question is contagious pleuro-pneumonia, and that at present it exists on Mr. Boadle's farm.

"That as the disease called pleuro-pneumonia, if allowed to spread, will be very disastrous to the colony, this meeting is of opinion that Mr. Boadle's cattle should be purchased, for the purpose of being destroyed; that a committee should be appointed to collect subscriptions to reimburse him, and see that the cattle are destroyed, with as little delay as possible."

A committee was appointed accordingly. It was proposed to burn the bodies of the animals on the farm. Greatly to Mr. Boadle's credit, he appears to have done everything in his power, and so far successfully, to prevent the spread of the infection.

YORKSHIRE SOCIETY FOR THE EXHIBITION OF FAT STOCK.

The third annual show of this society was held in the New Cattle Market, York, on Monday, Tuesday, Wednesday, and Thursday, Dec. 12, 13, 14, and 15. This year manifests a marked improvement in the condition of all kinds of animals exhibited, and proves that the farmer is now fully aware of the fact that the rearing and feeding of live stock is a very important branch of agriculture; much of the success of a farmer depending on the judicious management of his live stock. The great feature of the present show, however, was in the fact that the competition was open to all England; last year it was not so, parties residing in Yorkshire only being allowed to enter their stock. Increased advantages for competition necessitated a larger sum being given away in prizes, and accordingly this year between £250 and £300 have been expended in awards and articles of silver plate.

There was a splendid collection of short-horns this year, excelling in all points those exhibited at the last show. The most perfect animal in the first class (ox, not exceeding four years old) was undoubtedly that belonging to Mr. Richard Stretton, of Broad Hinton, Swinden, and it took the first prize. In the next class (ox, not exceeding three years old,) some most magnificent animals were shown. A stout bovine gentleman belonging to Mr. Taylor, of Sewerby Cottage, Bridlington Quay, was awarded the first prize. For the best cow, having had one living calf, Col. Towneley, of Towneley Park, Burnley, claimed the laurels; and the fame as a breeder which this gentleman has acquired, was certainly in no degree diminished at this exhibition. The contest in this class was very close, the beast belonging to Mr. Gell, of Grimston Hill, near this city, being possessed of fine symmetry. A silver tankard, of the value of £20, was given by the noble President of the Society to the best animal in the cattle classes, which was awarded by the judges to Col. Towneley, for a heifer bred by himself, three years and seven months old.

In sheep, the Leicesters were in full force, and some pens of capital animals were shown. Although fatted almost to repletion, and covered with a most redundant fleece, they were quite lively and active—a most pleasing contrast to what we have observed at other shows.

The competition amongst the pigs was excellent, and the entries numerous. In class 24 (best pig, small breed, exceeding twelve months old), Mr. Fall, of York, took the prize for a pig that was pronounced to be a most perfect animal by all who saw it, and which possessed so many points of excellence that it left its competitors far behind. All the other animals in this department were also worthy of commendation.

JUDGES.

CATTLE.—Mr. Rooth, Chesterfield; Mr. Thompson, Anlaby.

SHEEP AND PIGS.—Mr. Fisher, Leconfield; Mr. Johnson, Chevet Farm, Wakefield.

CATTLE.—SHORTHORNS.

Ox, not exceeding 4 years old, 8*l*., to Mr. R. Stratton, Broad Hinton, Swinden; 4*l*. to Mr. John Ellison, Allerton House, Knaresbro'.

Ox, not exceeding 3 years old, 8*l*., to Mr. George Taylor, Sewerby Cottage, Bridlington Quay; 4*l*. to H. S. Thompson, Esq., Kirby Hall. Mr. T. Robinson, Wingate Hill, Tadcaster, commended.

Cow, having had one living calf, 8*l*., to Lieutenant-Colonel Towneley, Towneley Park, Burnley; 4*l*. to Mr. Robert Gell, Grimston Hill. Mr. R. Gell, highly commended; J. Walker, Esq., Sand Hutton, commended.

Heifer, not exceeding 4 years old, 8*l*. and cup, to Lieut.-Col. Towneley; 4*l*. to the Earl of Carlisle. Lord Londesborough commended.

Heifer, not exceeding 3 years old, 8*l*. to Capt. Gunter, The Grange, Wetherby; 4*l*. to Mr. R. Gell. Mr. R. Gell, highly commended; ditto, commended.

CATTLE.—OTHER BREEDS.

Polled Scotch ox, 5*l*., to Mr. J. B. Dudgeon, Crakaig, Golspie, Sutherlandshire.

Polled Scotch cow or heifer, 5*l*., to Mr. T. Hill, Wetherby.

Highland ox, 5*l*., to Mr. R. Gell.

Highland cow or heifer, 5*l*., to Mr. John Carter, Leighton, Masham. Mr. J. Carter, commended.

Irish ox, 5*l*., to Mr. W. Ripley, Kirk Hammerton.

Irish cow or heifer, 5*l*., to Mr. J. Whitwell, Eldmire, Topcliffe.

Ox of any cross breed, 5*l*., to Mr. J. W. Pease, Woodlands, Darlington; 2*l*. to ditto. The class generally commended.

Cow or heifer of any cross breed, 5*l*., to Lord Londesborough; 2*l*. to Mr. D. Ainslie, Costerton, Blackshiels, Midlothian.

TENANT FARMERS' CLASSES.—SHORTHORNS.

Ox not exceeding 3 years old, 6*l*., to Mr. Joseph Heptonstall, Warren House, Tadcaster.

Cow having had one living calf, 6*l*., to Mr. T. Beal, Skirpenbeck, Stamford Bridge.

Heifer not exceeding 3 years old, 6*l*., to Mr. R. Middlebrough, South Milford, Milford Junction.

EXTRA STOCK.—CATTLE.

3*l*. to Mr. S. Wiley, Brandsby; 3*l*. to ditto.

SHEEP.—LEICESTER LONG-WOOL.

Pen of 3 wethers, under 22 months old, 4*l*., to Mr. W. Lovel, Nafferton Grange, Driffield; 2*l*. to Mr. J. Boast, North Dalton, Driffield. Mr. F. Rickell, Warter, Pocklington, highly commended. The class generally commended.

Pen of 3 ewes, £4, to Mr. Wm. Lovel. Mr. Wm. Lovel commended.

Pen of 3 horned Scotch or mountain wethers, £3, to Mr. D. F. Alderson, Great Smeaton, Northallerton; £1 to ditto. The Earl of Carlisle commended.

Pen of 3 wethers of any cross breed, under 22 months old, £3. to Mr. H. Bowser, Faxfleet, Howden; £1 to Mr. John Wells, Booth Ferry House, Howden. Mr. J. Wells commended.

Pen of 3 wethers, of any age, breed, or cross, except Leicesters or Cotswold, £3, to Mr. Q. Clark, Bilton; £1 to ditto.

Extra Stock.—Sheep.

10s. to Mr. F. Rickell; 10s. to the Hon. Admiral Duncombe.

Pigs.

Pig, large breed, of any age, £3, to Mr. Wm. Hindle, Barlby Bank, Selby.

Pigs, small breed, exceeding 12 months old, £3, to Mr. Wm. Fall, Walmgate, York; £1 to Mr. J. Singleton, Teresa Cottage, Pocklington. Mr. J. Singleton highly commended.

Pig, small breed, under 12 months old, £3, to Mr. T. Eeles, Islebeck, Thirsk; £1 to Mr. S. Wiley. Mr. Charles Edwards, Colliergate, York, commended.

Pig, middle breed, exceeding 12 months old, £3, to Mr. Geo. Strickland, Snaith; £1 to Mr. W. W. Wilberforce, Stockton Hermitage, York. Mr. R. W. F. Mills, Dunnington, York, commended.

Pig, middle breed, under 12 months old, £3, to Mr. Henry Hoggard, Clifton, York; £1 to Mr. W. Green, Earswick, York.

Pen of 3 pork pigs, under 6 months old, £3, to Mr. Charles Edwards; £1 to Mr. W. J. Ware, Skirpenbeck.

ROYAL DUBLIN SOCIETY.

WINTER SHOW OF ROOTS, GRAIN, AND STOCK.

The winter show of the Royal Dublin Society, which has generally taken place previous to the Birmingham and Baker-street exhibitions, was held on Tuesday and Wednesday, Dec. 13 and 14, in the Society's agricultural hall, Kildare-street, Dublin. In consequence of the show being thus held later in the season than usual, the Society was prevented from sending forward the collection of roots which it has been in the habit of exhibiting at the Baker-street show, under the superintendence of its agricultural curator, Mr. Andrew Corrigan.

So far, the specimens of Irish produce shown in Baker-street have effected much good, by directing attention to the capabilities of that fine country. For we have as yet but a faint idea of what Ireland is capable of producing, were the resources of its soil fully developed by systematic cultivation. It is true that the agricultural statistics which are taken annually in Ireland do not present very encouraging results to those who believe that the extended cultivation of roots is one of the great means by which the prosperity of that part of the kingdom is to be effected, and who consider a return to potato cultivation on a large scale as a backward movement. Still it is to be hoped that better modes of practice, and more correct habits of thinking on agricultural matters, will yet become general amongst the cultivators of Irish soil.

On looking over the different ranges of tables covered with farm produce at the late show, it struck us that there were, on the whole, perhaps rather fewer lots exhibited than we have seen at former Winter Shows of the Society. This we found to be actually the case; but it was very evident that the character of the exhibition was much improved in consequence of the greater uniformity of the various entries in the different classes and sections, and the absence of inferior lots. In some of the sections the competition was remarkably close, the roots being very fine, and the different parcels nicely matched. At the same time, all the classes were well filled, and some of them much better than usual.

The grain department contained some very good specimens, although there were none of very superior quality. The best sample of white wheat—grown by Mr. O'Reilly Dease, Palmerston House, county Dublin—weighed 62 lbs. per bushel; and the second best—grown by Mr. J. W. Chapman, farm-bailiff to his Grace the Duke of Leinster—weighed 61 lbs. The first lot was grown after mangolds, and the latter after one year's lea or seeds. There was only one sample of red wheat exhibited, of rather good quality; but it was disqualified, in consequence of the dressed grain not being accompanied by a sheaf, according to the regulations. We observed by the cards affixed to the prize samples of white wheat that there was a considerable difference in the quantity of seed which had been sown in the two cases. Thus, in the best sample 17 stones (238 lbs.) seed had been sown on the Irish acre (7,840 square-yards), whilst the Duke of Leinster's bailiff had only used 7 stones (98 lbs.) per Irish acre. The difference in the quantity of seed would make a very material saving over the entire breadth of wheat on an ordinary farm, and is a fact worthy of notice.

Barley is seldom grown in Ireland with as good a colour as it is in England, owing to the more humid climate, but the prize samples were very fair in this respect. The best sample—grown by Mr. O'Reilly Dease, after a crop of turnips—weighed 55½ lbs. per bushel, and was rather more equal than the second, which weighed 56 lbs., the grower of which was Mr. Hawkins, of Leopardstown, county Dublin, the preceding crop having been wheat. In this case, also, there was a considerable difference in the quantity of seed which had been sown. In the first case 16 stones (224 lbs.) had been sown per Irish acre, and in the latter 11 stones, or 154 lbs.

Of oats there were a considerable number of samples exhibited, all of which were rather deficient in the dressing. The first prize for white oats was gained by Major Gun Cunninghame—grown after turnips; and the second by Mr. James Perry, Monkstown—grown after lea. The first sample weighed 43 lbs., and the second 44½ lbs. per bushel. In the section comprising black oats, the first lot, weighing 41½ lbs. per bushel, was grown by Mr. Perry; and the second, weighing 39½ lbs., by Mr. O'Really Dease.

Of field beans there were several samples shown, many of which were very deficient in colour, and unequal. The first prize lot, however, was good, and weighed 66½ lbs. per bushel, grown by Mr. Hawkins; and the second sample, weighing 66 lbs., grown by Dr. Radcliff, was not much inferior in any respect. A very nice sample of scarlet tick beans, weighing 65 lbs. per bushel, was exhibited by the Hon. H. Sugden, and was much admired.

There were no samples of peas exhibited; and the only one of vetches was disqualified, in consequence of the sheaf not corresponding with the contents of the sample bag.

In Irish-grown flax-seed, the first prize was taken by Mr. David Patton, Glasslough, co. Monaghan, with a bright-coloured sample, weighing 54lbs. per bushel;

the second lot, weighing 53½lbs., having been grown by Mr. Bunbury, in Galway. In Irish-grown mangel-seed, the prize was gained by a very fair sample grown by Dr. Radcliff; a very excellent one, grown by Messrs. Dickson, Farrell, and Co., Belfast, not having arrived in time to be submitted to the judges. In Irish-grown turnip-seed, Mr. Allan Pollok got both prizes with two very good specimens of Skirving's swede and the purple-top yellow Aberdeens.

The next division—" Plants cultivated for their Stems, Bulbs, Tubers, or Roots"—included the principal and most generally-attractive features of this department of the show.

The first class on the list was kohl-rabi—a variety of plant which is by no means as extensively cultivated as it ought to be. The first prize lot, grown by Mr. Alexander, farm-bailiff to the Marquis of Kildare, was one of the best samples we ever recollect to have seen. The seed was sown in the beginning of March, in drills (ridges) 30 inches wide, the preceding crop having been oats; and the manure applied consisted of 25 tons of farmyard dung and 3 cwt. of Peruvian guano; the produce being 40 tons per Irish acre. The second lot, grown by Dr. Radcliff, was also a good lot, and would have been considered very fine, if the first lot had not been in every way so much superior.

Passing over the onions and potatoes—the latter including matured potatoes as well as seedlings of 1858 and 1859—in which classes several very beautiful specimens were shown, we come to the long red mangel. This class was well filled; and the lots were exceedingly equal. The first lot of six roots was grown by Dr. Radcliff, in drills 32 inches wide; manure, 40 tons of compost and half-a-ton of salt per Irish acre. The lot weighed 129lbs.; and the produce was stated to be 75 tons per Irish acre. The second prize lot was grown by the Duke of Leinster's bailiff, the preceding crop having also been mangel, and the manure applied 3 cwt. each of soot, salt, and guano per Irish acre. The lot of six roots weighed 118lbs.; and the weighed produce of 1⅝ acres was 126 tons. The third prize lot was grown by Mr. Allan Pollok, Lismanny, Ballinasloe, the well-known Scotch settler in Connaught. This was a lot of nice equal roots, grown after a crop of oats; manure, 20 "carts" of farmyard manure, 4 cwt. of guano, and 15 bushels of bones, with some salt, per Irish acre. The drills were 28 inches wide.

Of long yellow mangel, the heaviest lot of six roots weighed 148lbs., grown by Mr. Bolton, Leabeg, county Wicklow, on a peat soil, drills 30 inches wide; manure —40 tons of farmyard dung, 2 cwt. of superphosphate, and 5 cwt. of salt per Irish acre. There were one or two coarse roots in this lot. The second sample was grown by Dr. Radcliff, with 40 tons of compost per Irish acre, salt being applied in the after-culture. The weight of the six roots was 114lbs. Mr. Barlow's third prize lot was grown on farmyard manure intermixed with seaweed. In red globe mangel, Dr. Radcliff was the winner of the first prize with a lot which weighed 118lbs.; Mr. Waldron, Finglass, being second. The best sample of yellow globe mangel, grown by Dr. Radcliff, weighed 132lbs., and was altogether a fine lot, whether weight or shape of roots was considered. The second lot was grown by the Duke of Leinster's bailiff, Mr. Chapman, on boggy mould, after a crop of mangel, no dung having been applied since the previous crop. Mr. Chapman's system is to dibble-in the seed in the drill (ridge); and the quantity of seed used by him was only 2lbs. per acre, but we suppose it must have been the statute acre. Another excellent lot, which was highly commended, was exhibited by Mr. E. P. Westby, Dundrum, Co. Dublin. Of sugar-beet, there were several very fine lots on the table, the best of which, (large, well-formed roots) were grown by Dr. Radcliff. Before leaving the mangel class, there are two points to which we would wish to direct the attention of our readers, particularly as the cultivation of mangel is now a subject of great interest, owing to its comparative freedom from disease. The first of these points is the propriety of forming wide drills or ridges—the wider the drills the heavier the crop; and next, the importance, nay, the absolute necessity, for using salt as a manurial application in the cultivation of this plant.

Some time ago, a communication appeared in the "Journal" of the Royal Agricultural Society, from Mr. Caird, detailing the results of some experiments which he had made with salt in mangel cultivation; and the report of which was couched in such terms as to lead people to suppose that the beneficial action of salt in this case was in a great measure a new discovery; whereas it had been used for many years before that time, and in Ireland especially, the waste salt of the bacon stores in Belfast, &c., was eagerly bought up by farmers at nearly as high a price as clean salt, solely for the purpose of applying to the land previous to sowing their mangel seed.

The show of carrots was particularly good, the best indeed which we have seen in Kildare-street for many years. The best sample of the red variety was grown by Mr. Arthur D'Chaigneau, Westmeath, in drills 26 inches wide; produce 37 tons per Irish acre. The second lot was grown by the Marquis of Kildare, also in drills 26 inches wide: soil, a black, friable, sandy loam; manure, 25 tons farm-dung and 3 cwts. Peruvian guano per Irish acre: produce 20 tons per acre. The Marquis of Drogheda came in third with a lot grown on reclaimed bog, seed drilled on the flat, with 2 cwts. guano, 10 bushels ashes, and 4 cwt. superphosphate per acre: produce 20 tons per acre, grown after a crop of mangel-wurzel. A new variety of carrot, short but thick, and somewhat resembling the horn, but much heavier, grown by Mrs. Cosby, of Stradbally Hall, was highly commended. In white carrots, Mr. D'Chaigneau was again the winner of the first prize, with an excellent sample of a crop which produced 48 tons per acre. The weight of the twelve carrots which composed this lot was 53lbs. The lot shown by the Marquis of Kildare, which gained the second prize, weighed 56lb., the first lot being the best grown roots, although rather the lightest; and another good sample grown by Mr. Smith, Leamore Park, took its place as third in the class.

Of parsnips there was also a good show as to quality, but the lots were not so numerous as those in the carrot sections. Dr. Radcliff was first; and a very handsome lot grown by Mr. Barlow, Raheny, was second. A splendid sample grown by Mr. Putland, Bray, was unfortunately placed too late to be inspected by the judges, otherwise it must have come in first, both from the weight and shape of the roots.

There was a large and generally good show of swedes, notwithstanding the difficulty which has been universally experienced in raising a crop of this kind during the past year. Mr. Allan Pollok exhibited several lots, all of good quality, his first prize lot of six turnips weighing 128lbs. There is a rule of the society which states that at the winter show of farm produce "No exhibitor shall be entitled to obtain both the first and second prize in the same class of any of the articles exhibited." Consequently Mr. Pollok could not come in with any of his other lots, notwithstanding their weight, and the second prize in this section was given to Dr. Radcliff for a sample of "Shannon's Leinster swede," an exceedingly handsome turnip, of recent introduction.

In the next section, which included "Aberdeens, or other kinds," Mr. Pollok was again first, with a large and rather coarse lot, described on the card as purple-topped yellow Aberdeen, but which was a green-top white globe. The second sample, which was grown by the Marquis of Kildare, consisted of pure purple-top Aberdeens, and, although not so heavy as the first lot, was composed of much more handsome bulbs, possessing the finest possible shape—model bulbs in fact. Mr. D'Chaigneau's third lot was also pure purple top, and a nice lot, but not so perfect in shape as the preceding.

Of field cabbage there were several good samples exhibited, but nothing of more than ordinary character. The lots shown were quite sufficient, however, to prove the great value of this variety of plants for farm purposes.

The show of flax, both hand and mill-scutched, was very limited; and, considering the importance of this crop to the principal manufacture in Ireland, there ought to have been a much better turn-out on the part of the flax-growers. Mr. Patton, of Glasslough, and Mr. Robb, county Clare, were the principal exhibitors.

There were several excellent samples of butter exhibited, Mr. Patton's first prize lot being particularly so. In cheese there was only one exhibitor—a Scotch lady, Mrs. Reid, from the county Wexford—who showed three samples, of very good quality. Cheese-making is not much followed in Ireland, and the success which attends it is rather uncertain. This is a subject, in fact, which the Irish farming societies ought to investigate thoroughly.

The show of wool was very inferior, both in quantity and quality, and by no means what we ought to expect in Ireland.

In the special collections of farm produce Dr. Radcliff stood first, with a large and varied assortment; whilst Mr. Pollok's and Mr. Hutton's collections were also very good, although not so large as that exhibited by Dr. Radcliff. Mrs. White exhibited a capital collection, grown at an elevation of 800 feet above the level of the sea, in which a prime sample of white Holland oats was conspicuous. The Earl of Charlemont, whose veteran prize-taking manager, Mr. James Brady, has for some time given up competing, sent forward a large and beautiful collection of produce, which was specially commended, although not entered for competition. A very interesting portion of the vegetable show consisted in forty specimens of seedling potatoes of different and new varieties, grown by Mr. David Moore, the curator of the botanic gardens belonging to the Royal Dublin Society. Mr. Moore's attention has been specially devoted to this matter during the last ten years, and we think there are several of the varieties which he has succeeded in producing which will become of great importance. Another very interesting part of the show was the exhibition of produce grown on farms connected with public institutions, the first prize being taken by Mr. P. Boyle, agriculturist to the North Dublin Union, with a magnificent collection of roots, &c., in the cultivation of which boys alone—none of whom exceeded 14 years of age—were employed. The second prize was awarded to the agriculturist of the South Dublin Union, Mr. P. O'Brien, whose collection was also most creditable, and another clear proof of the benefit of employing pauper labour in this manner, whereby habits of industry are acquired by those who would otherwise be an unprofitable burden upon the public.

We now turn to the fat stock department of the exhibition, which, although it might not in every respect satisfy a Bingley Hall or Baker-street man, was, generally speaking, creditable. The Society was again much indebted to Mr. Allan Pollok, who was on this occasion also the principal exhibitor in the fat cattle classes. Taking, therefore, the different lots exhibited by that gentleman, we would remark that his prize bullock, two years old, was a beautiful specimen of good feeding. Some might consider that he had frame enough to carry a much greater weight of beef; but as shown, he was more than sufficient to satisfy any reasonable person. Mr. Pollok's prize West Highland ox was very prime, but the other cattle of the same breed shown by him in this class were not nearly as well finished. His cross-bred four-year-old ox had a famous rib and loin; but being pitted against an extraordinarily well finished animal, a cross between the polled Angus cow and Shorthorned bull belonging to Mr. Thomas Gerrard, he had to yield to the superior quality of the latter. We scarcely ever remember to have seen so thoroughly finished an animal *upon grass alone*, as Mr. Gerrard's ox. His back, loin, and rumps were covered with masses of flesh, and on handling he was found to be perfectly firm all over. Mr. Pollok's pair of oxen, worked in the plough up to May last, were coarse. A lot of three polled Galloway bullocks, bred and fed by Mr. Pollok, were much admired, and one of the lot, a two-year-old, was awarded the prize as the best of all the fat oxen of any age or breed. His quality was particularly good, and so uniform was he, that it could scarcely be said that he was better in one place than in another. In the class of Highland cows, Mr. Pollok showed two prime specimens of that admirable breed, and in Shorthorn heifers, his four-year-old heifer took the prize as the best in her class, and the best of all the prize heifers. Her back and loin was grand, but she handled soft. In the class for heifers of any age or breed, Mr. Pollok showed three lots, two of which got the prizes belonging to the section. They were not of particularly fine quality, but useful enough for general purposes. Mrs. Laurie's prize three-year-old shorthorn bullock was particularly well-finished, of good quality, and even. A lot of good and very heavy four-year-old bullocks were shown by the same lady, in the class against Mr. Pollok's Galloways, and deservedly received a high commendation, although they were not equal in quality to Mr. Pollok's lot. Mr. H. Tuite's Devon ox was a little slack in the back, but on the whole a sweet animal, and fully finished. Mr. Tuite also showed a prime Hereford cow, not very large, well-covered all over, and full of inside fat. Decidedly the fattest animal in the show was Mr. Farrell's shorthorn cow, an exceedingly well-proportioned animal. She had uncommonly fine fore-quarters. Mr. Garnett's cow (second prize) was particularly good in the loin and fore-quarters. Colonel Leslie's cow, in the same class, was very heavy in flesh, but soft. Of Kerry cows there was only one specimen, and she had a good loin, but bad fore-quarters. Mr. Barton's shorthorn heifer (second prize) was extremely well-finished, and very superior in her buttocks. The Kerry heifers were very indifferent. It must be remarked, with reference to the prize offered by the Smithfield Club for "Irish breeds," that the Kerry is the only real Irish breed of cattle, and consequently, if feeders from that part of the kingdom entered their stock for competition at Baker-street, they must take their place in the Shorthorn or other classes. If the object of the Smithfield Club is to encourage entries from Irish graziers, the prize-sheet must state, "Cattle bred and fed in Ireland," instead of merely "Irish breeds," Ireland being in this respect differently situated from Scotland, which has the polled Angus and Galloways, the West Highlands, the Ayrshire, &c., as native breeds.

The sheep classes were but moderately filled, and, strange to say, one of the best pens of wedders exhibited were placed second to a lot in very moderate condition. The lot we refer to, as being undervalued by the judges, was a pen of Lincolnshire two-shear wedders, shown by Mr. Francis Page, of Lincoln. They were remarkably good sheep, and very heavy. The first prize-lot had been "fed on grass only," according to the entry in the catalogue; and we suppose the judges thought it best to discourage the use of "rape and cake," which had been employed in fattening the rejected Lincolns. Mr. William Owen showed a pen of well-finished shearling Leicester ewes, for which hegot a prize; and Lord Talbot de Malahide had two pens of Leicester ewes, both of which got the prizes in their class. Besides the lots we have named, and a pen of Lincoln ewes shown by Mr. Page, there was nothing which exceeded respectable mediocrity. Surely the Irish graziers can turn out a larger and better show in this department.

There was a very poor show of pigs, the only one worth looking at being a Berkshire, belonging to Mr. Metge. Considering the really good pigs we have observed at the spring shows of the Royal Dublin Society, and the shows of the Royal Agricultural Improvement Society, we feel quite at a loss to account for the meagre show which we witnessed in Kildare-street last week.

There were some capital poultry shown, particularly Mr. Farrell's Dorkings, Mr. Williams's spangled Hamburgs, and Mr. Wilkins's turkeys. This part of the show ought not to be crammed into a corner, as it was, where people could not see the fowl, and where two moderately expansive articles of female attire completely blocked up the passage.

The implement part of the Winter Show is necessarily confined to very restricted limits; but although there was not room for any great display, there was a fair turn-out of representatives from several well-known firms. Amongst these were Keenan and Son, Dublin, with their collection of foresting and fencing tools, mowing-machines, &c.; Hodges and Son, Dublin, steaming apparatus, field-gates, &c.; Edmundson and Co., Dublin; with specimens of the manufactures of Ransomes and Sims, Picksley, Sims, and Co., A. and T. Fry, E. H. Bentall, N. Smith, &c.; John Maguire, Dublin, garden-chairs, churns, &c.; N. Smith, Thrapston, horse-rakes, corn-drills, cake-mills, &c.; Smith and Ashby, Stamford, haymaking-machines, horse-rakes, portable steam-engines, chaff-cutters, &c.; T. Bradford, Manchester, washing-machines, &c.; Walker, Manchester, steam-engines, &c.; Perry and Sons, Glasgow and Bilston, gates, iron fences, &c.; Richmond and Chandler, Salford, with a large collection of their chaff-machines, corn-crushers, turnip-cutters, steaming apparatus, root-pulpers, &c.; Picksley, Sims, and Co., chaff-machines, gorse-cutters, turnip-slicers, grain-grinder and bruiser, &c.; Samuel Hudson, Dublin, saddlery; J. T. Mitchell, Dublin, thrashing-machines; A. Nixon and Co., Liverpool, steam-engines; Shekleton, Dundalk, steam-engines, chaff-cutters, linseed-mills, steaming apparatus, swing-ploughs, &c.; Rennie and Sons, Newry, thrashing-machines; Grey and Co., Uddingston, Glasgow, steam-engine, thrashing machine, ploughs, grubbers, &c.; Thomas Pearson, Dublin, mill-stones, oatmeal-sifters, &c.; Banks, Liverpool, iron fences, churns, sheep-racks, &c.; Dickson, Hogg, and Robertson, seedsmen, Dublin, with a collection of specimens of grain, grasses, roots, &c., amongst which was a long yellow mangel weighing 37½lbs.; Bridgeford, Dublin, hardy coniferæ; Thorley, of course, and his opponents, Messrs. Retigan, of Manchester; besides manure-vendors, &c.

EXPORT OF VALUABLE BREEDING CATTLE TO CALIFORNIA.

The great attention paid in this country to the improvement of the breeds of cattle has obtained for us an enviable character, not merely in Europe, but the fame of English-bred stock spreads also among the enterprising and intelligent citizens of the United States. So true is this, that every year we are visited by some sagacious Americans, for the purpose of selecting animals suited to improve the breeds of cattle in the fertile prairies of the West. This species of traffic appears to be rising in estimation all over the Union; and only last week a considerable number of splendid specimens of the Durham shorthorned breed were conveyed from Liverpool for San Francisco. They were shipped by Mr. Bell, of the Adelphi coaching establishment, in this town, on account of Mr. James Bell. The animals, as already stated, were admirable specimens of the shorthorned breed, and were selected with great care and judgment from the herds of the most eminent breeders. They showed all the marks of great purity of blood, and were, we understand, the first ever exported from this country for California. Besides these, it affords us pleasure to note that Mr. Bell has also just completed an extensive shipment of choice sheep on board the Ellen Sophia and the Norfolk for the River Plate. These latter animals included Saxony, Southdown, and county Meath sheep. Judging from the wide distinction in the breeds of these, and also of others previously despatched to the same region, it appears that the breeders there do not grudge expense in carrying out their plans for improving the staple of the wool, and also for producing an improved and better-flavoured quality of mutton. We understand Mr. Bell will in a few days ship a selection of shorthorned cattle, Alderney cows, and Shetland ponies for New Orleans. From the preceding notes, it will be seen that a very considerable traffic in the export of breeding cattle of all classes is now carried on in Liverpool.

While on this subject, we have much gratification in giving the subjoined extract from *The Country Gentleman*, published at Albany, in the State of New York, on the 29th of September last: "Kerry Cattle and Shetland Ponies.—Just before his departure the writer saw at the Adelphi stables, in that city, several specimens of those singular breeds, in charge of Mr. Bell, who was soon to ship them for the United States. They had been purchased by Mr. Howard, of Boston, during his recent tour, in addition, as Mr. Bell stated, to thirty-two head of Ayrshires, a fine Cleveland stallion, a number of the Scotch blackfaced sheep, and a Cotswold ram. The Kerry cattle were alluded to in a letter from Ireland. They will be regarded quite as curiosities here, from their stunted size, for they come from among hills where they can find only the poorest sustenance, and, indeed, they are said to require little more food or shelter than a goat. Scarcely sufficient credit, by the way, has been given in this country to the efforts made by Mr. Bell in the shipment of stock at different periods for several years back. To his care and faithful attention the success of many of our most valuable importations have been due in no small degree."—*Northern Times, Dec.* 15.

CULSHAW, THE TOWNELY HERDSMAN, TO BEAUTY'S BUTTERFLY.

AIR—"*She's all my fancy painted her.*"

BEAUTY, and MASTER BUTTERFLY,
Your daughter is divine;
There's but one tiny crumple,
From her huggins to her chine:
There's few can show the calves I can,
Yet few dare feed so high;
Has RICHARD BOOTH a Queen like you?
My Beauty's Butterfly!

Your neck-vein knows no equal,
Your bone and offal's light;
Your horns are sweet and waxy,
Your eye is soft and bright:
It still will look its love for me;
Let Steers and Devons die—
No Christmas knife will touch the throat,
Of Beauty's Butterfly.

My Butterflies in summer bloom,
And neath the winter's blast;
You've won the two gold medals,
And railroad toils are past:
For years, mid happy pastures,
You'll own your JOSEPH nigh,
And plant soft kisses on his cheek,
My Beauty's Butterfly!

—*Punch.*

CALENDAR OF AGRICULTURE.

The first month of the year, and the last of the winter quarter, is generally stormy and cold, dry frosts and snows, and not so changeable as the two preceding months in rains and alternate temperatures. During fresh weather plough grass leys to be sown with Lent grain crops, and last year's stubble grounds to be fallowed for root crops; all lands are the better for being early ploughed, heavy soils are pulverized by the vicissitudes of atmospheric action, and light lands acquire a consolidation from lying in a certain condition. In the case of light lands this firmness has been found to be of very great importance.

During frosty and stormy weather carry dung from the cattle yards to the heaps in the fields that are to be planted with green crops. Form the heaps with sloping ends, that the carts may pass over them and deposit the load, when the strawy contents are evenly spread over the space : the treading prevents fermentation until the heap is turned over for use. Carry stones to drains for walling, and earths to the compost heap and to the liquid manure pit, where earths are used for the purpose of absorption. Deliver grains to the merchant; carry fuels, and collect all kinds of manures.

In fresh weather cut hedges, underwoods, and copses; plant young trees; dig drains in the half-depth, to be afterwards deepened and finished in summer; clear water-courses; clean the sides of roads, and carry the earths to the compost heap; sow wheat on fallows omitted in autumn, and on strong lands after turnips and other roots.

Remove Swedish turnips from the field, cut away roots and tops, and place the bulbs in longitudinal heaps at the homestead, six feet wide at the bottom four feet in centre height, with the sides sloping, and thatched with straw. Choose a cool situation; lay in store, in provision against a lasting storm, a quantity of common turnips sufficient for a month's consumption : keeping beyond that time produces a mouldy distaste.

In every kind of weather never omit to collect manure : reckon a compost heap a most indispensible requisite on any farm, to which refuse materials of every kind are to be carried, and in sheds, under cover, prepare the artificial manures for the drop-drill. Float water-meadows, and lay dry occasionally.

Thrash frequently, that the animals may get fresh straw for constant use, for provender in the yards, and for being cut into chaff. Move often the standings of the cribs of straw in the yards, that the dung underneath may become of an uniform quality, and litter often the whole area of the yards thinly and evenly. Bestow the most minute attention on every detail of practice.

Give turnips and other roots to the fattening and store cattle in the yards by break of day, in such quantities as are consumed by night, in order to prevent accidents by choking when darkness prevents the observation. Wooden cribs with latticed bottoms are best for holding turnips, as the water and muddy filth find a ready escape downwards. A few young pigs are very useful to run loose in the yards, to pick up the shells and scraps of turnips that fall from the cattle.

Attend most carefully to the state of the milch cows, which will now begin to drop calf. The secretion of milk must be promoted by the use of juicy food, and for this purpose the cows must have at least one feed daily of roots mixed with chaff, and prepared by steaming, and given about mid-day. Suckle all calves, either for weaning or for veal. No substance yet found is better than nature's milk from the mother. Feed the calves thrice a-day.

The sheep in the fields will require very regular attention in feeding and tending. Give the turnips in a fresh state daily, pulled from the fields if possible. Early ewes will begin to drop lambs, and must have ample feeding with juicy food, and sufficient shelter in covered sheds.

Feed bacon hogs twice a-day with steamed roots, as potatoes mixed with meal and bran. The food of brood sows may be thinner and more washy. Store-pigs may have the roots in a raw state, and one feed of cooked food daily. Bacon hogs must be finished for the market by a month's feeding with hard corn, as oats and beans. This is necessary in order to produce firmness and whiteness to the flesh.

The poultry must not be neglected. Feed with light grains, and with steamed potatoes mixed with meal and placed in troughs under a shelter-shed. Poultry-houses should be heated underneath by means of pipes containing hot-water from the cooking boiler. By this means the hatching of chickens may go on during winter.

The foremost fattening bullocks and the early bacon hogs will come in for sale during this month, and will command a ready market at this early season, for such articles being scarce a better price is obtained. This circumstance should stimulate the farmer to have things in advance as much as possible:

Work horses are much benefited by one feed daily of steamed potatoes or other roots given in the evening, when they return from work.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Protection, not forcing, can be done during the very uncertain weather of this period of the year, and frames and lights must be used to produce early salads, lettuces, and radishes. The time admits suggestions, but hardly any directions: yet linings may be applied of dung, fern, or straw, laid thick around the box and lights or brick-pits, so as to exclude a frost of 20 degs., which often comes and lasts many days. Fine intervals of weather must admit fresh air daily, but the sashes are closed every night, and covered with straw-mats during freezing times, which is a most effective protection.

In open weather and free working ground the green and white coss-lettuce, and the brown Dutch and a sprinkling of short-topped raddishes can be sown on a warm border, the soil to be open and rich to promote quick growth, and covered with straw or fern during cold nights. Sow radishes twice.

A little horn carrot seed, a drill of round spinach, some mustard and cress may be sown, but little good will result in general.

Peas and broad beans should be sown at least 2½ or 3 inches deep, in soil enriched in the autumn.

Earth-up peas and beans if any be ready, observing to select the driest weather. Transplant cabbages from the seed-beds.

In frosts protect the frames and cauliflowers under glasses, celery by a couple of boards laid ridgewise, or by straw on each side of the ridges; wheel out manure to be ready for plots, asparagus beds, &c., &c.

Fruit Garden.

In the fruit garden prune very little unless the buds swell materially; lay manure around the roots of gooseberry, currants, and raspberry bushes: it very much promotes the spring growth. Do the same also to fruit trees and espaliers.

If snow abounds, recollect to have it whisked or shaken off all the evergreens before the sun breaks out: nothing tends so effectually to prevent scalding and other accidents of the foliage. Do nothing in the way of planting flowers, but sow seeds in pans, mark each, and place them in a frame. Much time and labour are economised and flowers better secured by this method of proceeding.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR DECEMBER.

During the greater portion of this month, the weather has been very severe, and all out-door labours have received a check. Nevertheless, for the most part, they are seasonably forward. Although only moderate quantities of wheat have been thrashed out, and although the various markets have been very moderately, in some instances scantily supplied, the demand for that description of produce has been wholly restricted to retail quantities, at prices equal to the previous month. However, an impression is very generally entertained that there will shortly be a revival in the trade, and that, consequently, higher rates will prevail. We have no hesitation in saying that the chances are more in favour of enhanced than reduced quotations; but, at the same time, seeing that there is a great want of speculation, and that both millers and bakers seem determined to purchase for immediate wants only, our impression is that there is no room for what may be termed excitement in the trade. Prices will, we imagine, creep up quietly, under the influence of a steady consumptive enquiry, notwithstanding that we may continue to receive full average quantities from the westward. Our foreign advices are, for the most part, of a character calculated to impart steadiness to the trade; but we must bear in mind that there is a large surplus quantity of wheat abroad, and that a rise of 5s. per sack in the price of flour would lead to extensive shipments from New York, since we learn that stocks there are very large, and that the American farmers hold heavy supplies of wheat. As regards the future value of Spring corn, which for some time past has ruled steady, we may intimate that there is very little chance of any positive decline in it. Fine barley and good sound oats will, no doubt, command extreme rates during the next three months, owing to their scarcity. The great activity in trade generally, both home and foreign, and the enormous consumption going on, added to the small quantity of produce in warehouse, must, we think, have their accustomed influence upon value.

Although large supplies of potatoes have come to hand in fair condition, unfavourable accounts have continued to reach us from various quarters in reference to the progress of disease. Some correspondents affirm that fully one-half of the crop is diseased. If this statement be correct, prices—which now range from 70s. to 140s. per ton—must rule higher, and we shall have enhanced quotations for wheat, since that grain will become in active request. The importations of potatoes from abroad have, as yet, been very moderate, and we believe that the foreigners have very few to spare for us. Last year, at this time, potatoes were selling at from 40s. to 100s. per ton. and the supplies from all sources were very large.

The stock markets have been abundantly supplied with beasts for Christmas consumption; but the supplies of sheep have continued limited, as is usually the case at this season. The cattle trade has ruled healthy. Prices have been fairly supported; and the enormous receipts of beasts have changed hands. In most of our leading grazing counties food is somewhat abundant, and comparatively low in price. This is an important element in stock-feeding.

Since the close of the public sales, the transactions in foreign and colonial wool have been trifling; nevertheless, prices have ruled steady. For English wool there is an improved inquiry, and very few sellers are now coming forward unless on higher terms. The stocks in most quarters appear to be considerably reduced.

Although there have been two successive large growths of hops, and although the supplies on hand are extensive for the time of year, a large speculative business has been transacted in all new qualities, at rather an important rise in the quotations. The speculation carried on has been a most extensive one: it has not been restricted to a few houses, but has extended itself to numerous "strong" hands. The probability is, therefore, that, by withdrawing samples from sale, further efforts will be made to enhance the currencies. The produce of the bine on the Continent appears to have turned out very well, and much higher prices would, no doubt, induce some heavy shipments from Germany.

In Ireland the stocks of grain appear to become more limited; indeed, importations of wheat from England have been made into some of the Irish ports. The corn trade, however, has been far from active; and the same indifference shown here to speculate has been observed in most of the leading markets. The wheat trade in Scotland has been devoid of animation, at late currencies; but there has been an active inquiry for good sound barley and oats, partly for shipment to the south. The produce of the crops generally appears to have exceeded that of last year to some extent.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that a large amount of business has been transacted in stock for Christmas consumption, the beef trade has not ruled so active as was at one time anticipated, and the

Prices paid have very little exceeded the average run of years at this period. The numbers of beasts brought forward have been very large, and, for the most part, of unusually good quality; but the most attractive features during the month have been the Smithfield Club Cattle Show, and the great market at Islington. The supply of beasts exhibited at the former has proved one of the best on record, as far as the interests of the producer, butcher, and consumer are concerned; and that of the latter has turned out wonderfully good—indeed, it may safely be pronounced the best, both as regards number and quality, ever seen. Here we would remark that for some months great complaints have reached us from various sources to the effect that stock has been very scarce; but the result of the month's trade proves to our minds that there has been a larger supply of really good and useful beasts in the whole of our leading counties, including Ireland, than has been generally imagined. The fact that the arrivals have increased to some extent appears to have had no depression in the trade. Everywhere prices have been kept up remarkably well, in a comparative sense, although, since the great day was held, the trade has been in a nominal state, arising chiefly from the enormous quantities of meat derived from Scotland and various parts of England, and disposed of in Newgate and Leadenhall. The present prospects of the trade for all kinds of stock are still flattering: consumption is very large; and the commerce of the United Kingdom was never on so sound and satisfactory a basis as it now is. Whilst this state of things continues, and whilst we remain at peace with our neighbours, fat stock—even though the importations may be on an extensive scale—must continue high in price.

The supply of natural food in most grazing districts is large for the time of year, consequently there is now only a limited outlay for cake. The close of what is termed the "northern" season enables us to form a correct opinion of the capabilities of Lincolnshire, &c., in furnishing supplies for London consumption. As far as we can understand it—looking to the average abundance of keep, and the general condition of the shorthorns—the Lincolnshire graziers, unless, indeed, they paid too high prices for store animals, have had a successful season. Certain it is that the beasts have arrived in, for the most part, prime condition; and it is equally certain that high quotations have been realized for good stock, whether pure shorthorns or crosses. The commencement of the Norfolk season is regarded with some anxiety; but we understand that it is likely to produce more beasts of fine quality than in 1859, and further, that sheep are somewhat plentiful.

The total supplies of stock shown in the Metropolitan Market havr been as follows:

Beasts....................	24,484	head.
Cows	470	„
Sheep	78,980	„
Calves	1,171	„
Pigs	2,187	„

COMPARISON OF SUPPLIES.

Dec.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1858......	20,523	490	74,274	1,412	2,450
1857......	19,830	375	69,132	1,209	1,915
1856......	23,995	475	73,200	1,526	2,380
1855......	22,412	590	94,030	1,376	3,184
1854......	20,298	120	88,880	1,573	2,746
1853......	23,314	484	88,480	1,143	2,403

Beef has sold at from 3s. 2d. to 5s. 4d.; mutton, 3s. 4d. to 5s. 4d.; veal, 3s. 8d. to 4s. 10d.; and pork, 3s. 6d. to 5s. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	Dec., 1856.					Dec., 1857.					Dec., 1858.				
	s.	d.		s.	d.	s.	d.		s.	d.	s.	d.		s.	d.
Beef, from	3	10	to	5	0	3	0	to	5	0	3	0	to	5	4
Mutton ..	4	0		5	6	3	2		5	0	3	2		5	4
Veal	3	8		5	6	3	10		5	6	3	4		5	0
Pork	3	8		5	4	3	6		5	4	3	2		4	2

From the above it will be seen that pork has sold at from 4d. to 10d. per 8lbs. more money than in December last year. This advance, however, was long since anticipated by us, and we may state that it is the result of the wholesale slaughter of young pigs at the period when they were very numerous in this country, and when prices were much lower than they now are.

The arrivals of beasts from Lincolnshire, Leicestershire, and Northamptonshire, have amounted to 11,000 shorthorns and crosses; from other parts of England, 6,300 of various breeds; from Scotland, 1,660 Scots and crosses; and from Ireland, 1,440 oxen and heifers.

The imports of foreign stock into London have been as under:

Beasts....................	2,649	head.
Sheep	13,754	„
Calves	844	„
Pigs......................	183	„
Total................	17,430	„

In the corresponding month in 1858 the importations amounted to 19,099; in 1857, 6,608; in 1856, 11,079; in 1855, 19,515; in 1854, 18,349; in 1853, 21,918; and in 1852, 11,870 head. The general quality of the beasts received from the Continent of late has not improved, but the sheep have come to hand of great weight, and in many instances remarkably fat.

The dead markets have been overstocked with meat. However, a very large business has been passing at the annexed quotations: Beef has sold at from 2s. 8d. to 4s. 6d.; mutton, 3s. 2d. to 4s. 6d.; veal, 3s. 8d. to 4s. 6d.; pork, 3s. 6d. to 5s. per 8lbs. by the carcase.

REVIEW OF THE CORN TRADE

DURING THE PAST MONTH.

The month of December has closed with remarkable changes in its temperature. It opened with heavy rains, which gradually subsided, and on the 14th commenced a most intense frost, which, in less than a week, closed the inland navigation; but, on the 21st this ceased, and brought about an average temperature, which has continued through the month. As very little snow fell, and much of the young wheat was of very feeble growth, we have yet to learn whether much injury has been sustained; but such fluctuations must be hurtful more or less, and should they continue, spring will open with but a poor prospect for the coming crop. The markets being generally well supplied, and the long prevalence of wet and damp weather having seriously affected the condition of the samples, there has been a dragging trade, with no quotable change of value, through the month; but the few dry parcels met with have quite obtained former rates. Upon a review of the year's averages, we find the lowest point commenced on January 1st, when only 39s. 10d. per qr. obtained; and from this there was but moderate advance, with slight fluctuations, up to May 7th, when it reached 44s. 10d. On the following week it was 52s. 5d., and on the week afterwards the highest average was realized, viz. 54s. 4d.—making the extreme difference 14s. 6d. per qr. This sudden advance was occasioned by the outbreak of war in Italy between France and

Austria, with the false news that Russia was likely to interfere, and all Europe be engaged; and with such a prospect, it must be admitted that prices then were only moderate; but as the war seemed limited, as the French commissariat was well provided, and every victory declared on the side of France, leading finally to an armistice on the first week in July, and as the prospect of a new harvest opened, there was a gradual decline to 41s. 10d. on the 24th September; the year closing with 43s. 6d. And now comes the question how farmers are likely to fare in the coming year. Without any prescience, we can only make probable calculations upon data in hand. All accounts now agree with regard to the last wheat harvest in this country—that it was below an average. A very painstaking statement was given on the 19th ult. in the *Mark-lane Express*, showing that in two hundred and fifty-seven accounts received, only fifteen were above an average, and only nine reported good quality: the calculation making a deficiency in the yield of wheat of about one million and a-half quarters, and fully as much to be added for less produce in flour; but the flour this year being of better quality, and the weight of the wheat of 1858 per bushel being about 2lbs. above an average, we cannot estimate the deficiency of flour in the same ratio, but calling it equal to 500,000 or 600,000 qrs. only, at least a total deficiency of 2,000,000 of qrs. appears. Potatoes, which in this country are next to bread, are considered to be half lost. Maize has come short in America, Southern Europe, and the Danubian Principalities; so has rye in every country but the small State of Denmark; and, therefore, we are thrown upon overplus stock in England, and the yield of last year in foreign parts, for nearly all the old was used up on the new gatherings. A few small northern countries only, speak well of the yield and quality, viz. Denmark and Sweden, to which, for quality, Scotland may be added. France, who by her former abundant harvest had taken the place of America as regards British supplies, is held at least to be deficient 20 per cent.; so is Belgium. Holland, Germany, and Russia, as well as Egypt and Algeria, are somewhat below an average; while Spain, Portugal, and Italy have all suffered very heavily from drought, and are become dependent on foreign aid. America, after a bad harvest in 1858, has now a fair one, and perhaps may have a million and a-half qrs. surplus; but little has yet come from that quarter in consequence of the low range of prices in Europe; nor at this advanced period is it at all probable that the export, even with an adequate inducement, would reach that quantity. More interest than usual must, therefore, attach to the state of the growing crops in every country; and, though the stocks here are still good, they would be no impediment to a rise at least of 10s. per qr. on a reduction of foreign imports, or any serious disasters. The following quotations will show the range of prices ruling at the different places noted by last advices:

The best wheat at Paris was worth 49s. per qr., and at Bordeaux 47s. per qr. The quotations at Antwerp for Zealand white were 50s.; for native, of best quality, 57s. per qr. At Louvain fine 62lbs. and 64lbs. red wheat brought 48s. per qr.; which was the top quotation also at Hambro' and Zurich. Amsterdam quoted 56s. for high-mixed Polish. Fine quality at Maestricht was worth 50s.; good red at Groningen, 44s. 6d. per qr.; at Cologne the top price was 47s.; at Dantzic choice white was scarce, and not to be had under 52s. to 53s. per qr., but fair quality was procurable at 48s.; and this latter price ruled at Konigsberg; red at Stettin was worth 45s. 6d. per qr.; Ghirka wheat at Odessa was about 42s. per qr.; Berdianski wheat at Algiers brought 47s. per qr.; white Kentucky, weighing 62lbs. per bushel, at New York, was bringing 52s. per qr., and red 48s. Several places in Italy, in consequence of not receiving the expected Mediterranean supplies, were much dearer: white wheat at Leghorn sold at 55s., red at 52s.; Palermo quoted 51s.; and wheat at Naples, with all the efforts of government to keep down prices, had risen to 63s. per qr.—several places in Spain being equally high.

The first Monday in London commenced on moderate supplies, especially of foreign quality. The show of samples from Kent and Essex during the morning was scarcely an average, and the condition worse than even the bad weather led the trade to expect. Country reports being firm, there was a fair sale, considering the low quality, and any superior brought extreme rates, but very little of this description was to be had. Foreign was firmly held; but the business passing was on a small scale. But little difference subsequently obtained in the country reports. Birmingham and Hereford, as well as Bristol and Gloucester, were dull; but the Yorkshire and Lincolnshire markets were generally firm, and full priced for good quality, as Hull, Stockton-on-Tees, Boston, Spalding, and Sleaford. The first market of Liverpool was dull, and 1d. to 2d. per cental lower, which prices did not recover on Friday.

The receipts on the second Monday were little more than during the week previous. But little was sent up from Kent and Essex, and that again mostly in extremely bad condition. This circumstance, together with a dense fog that prevailed all the morning, brought business to a low ebb. A few picked parcels, the condition of which could only be determined by the hand, went off well; but other sorts, even where buyers were needy, could only be quitted by some reduction in price. As fine white foreign wheat was scarcely to be distinguished from red, there was nothing doing, excepting in bulks of previously known character, and these few sales were at full prices, opinion being strongly in favour of holding. Though, from the time of year, business in the country was mostly on a small scale, several markets improved 1s. per qr., as Birmingham, Newcastle, and Woodbridge. Hull, Leeds, Uxbridge, Royston, Boston, and Manchester were also firm; but Wolverhampton and Salisbury found the sale dull, at barely former prices. Liverpool on Tuesday was without change, but on Friday there was rather more tone in the wheat trade, as well as in other grain.

The third Monday, with a rather increased home supply, had only 450 qrs. from abroad. A frost having come to the help of the samples, there was some little improvement in the few parcels that were exhibited in the course of the morning, from Essex and Kent; but there was not enough fine quality to make a brisk market. Still all that was good went off at fully the previous rates. The markets in the country were much of the same character: Manchester and Royston were rather improved in sales; but Birmingham found a heavy trade at 6d. to 1s. per qr. decline, the supply being beyond an average. Liverpool on Tuesday recovered the late decline of 1d. to 2d. per cental; but on Friday, with Christmas in immediate prospect, there was very little done.

The fourth Monday being kept as a holiday, it was anticipated in London on the Friday previous, when the whole aspect of the Corn Exchange, with very small supplies, seemed to denote a determination to do nothing till the holidays were over, and to have forced off English wheat in such circumstances was considered undesirable. The markets subsequently held were without change.

The imports into London for the four weeks in Dec. were 32,882 qrs. of British growth, and only 17,285 qrs. of foreign, against 24,951 qrs. British, 52,393 qrs. foreign, in Dec. 1858. The imports of flour for the same time were 76,858 sks. country-made, 220 sks. 10,458 brls. foreign, against 74,386 sks. of country, 6,118 sks. 6,111 brls. foreign, in Dec. 1858. The imports into the kingdom for the month of November last were 327,278 qrs. wheat, and 174,111 cwts. flour. The flour trade, like that in wheat, has been very monotonous in its character: slight variations only have taken place in the value of Norfolks, say from 6d. to 1s. per sk., according to the weather and supplies; but prices left off as they began, viz., at 31s. per sk. Town quotations have also remained with 43s. as a top price. Though French supplies have almost entirely ceased, the many inquiries for American have brought some recent supplies, but they have been generally held too high to suit the consumptive demand, being more available for export. The average quality has been held at 27s. per brl., or 38s. 8d. per sk.

The value of all sorts of barley has rather declined in the course of the month. The first Monday had heavy supplies of all sorts, excepting English malting, which, however, was quite made up by the abundance of Scotch samples. This sort, as well as foreign grinding, then declined 1s. per qr., and the medium descriptions were fully 2s. per qr. down, with extreme difficulty in sales. The next Monday, and every succeeding market, still showed a downward tendency, so that the actual reduction has been about 1s. to 3s. per qr. There now seems little chance of a recovery of the late high prices, the strike in the building trade having greatly reduced the sale of malt, and it being likely that maltsters will make up any deficiency in the quantity of first-rate samples, by a more liberal use of the secondary descriptions. The imports into London for the four weeks were 36,282 qrs. British and 54,886 qrs. foreign, against 17,810 qrs. British and 78,814 qrs. foreign for December, 1858. The imports for the United Kingdom in November were 211,776 qrs.

The malt trade, though prices remain little altered, has been unusually heavy throughout the month, from the cause just noted, and had sales been forced prices must have been 2s. to 3s. per qr. lower.

In oats, also, there has been very little alteration. The first Monday, on very heavy supplies of foreign, gave way 6d. to 1s. per qr., and the heaviness lasted to the third Monday, when, with very limited arrivals, the decline was partly recovered, and wholly so on the last market, with another small show, but the sales were of a retail character—the stocks yet in granary, as well as the time of year, being against an advance; still we think, should the Baltic remain closed, prices must again advance, as but few come from Ireland or Scotland. The imports into London for four weeks were 9,881 qrs. English, 6,903 qrs. Scotch, 5,125 qrs. Irish, and 82,695 qrs. foreign—against 2,418 qrs. English, 10,521 qrs. Scotch, 5,413 qrs. Irish, and 113,109 qrs. foreign in December, 1858. The imports for all the kingdom in November were 109,758 qrs.

The supply of beans for the month has been ample, both in English and foreign, and the trade has been languid, with the prices of new English somewhat lower, but we anticipate little farther change, the supplies from Egypt not being expected to prove heavy this season, and unless there be some advance, it does not seem likely many will come from France, though the crop there is said to have been good. The imports into London for the four weeks were 5,181 qrs. English and 10,127 qrs. foreign, against 3,542 qrs. English and 13,689 qrs. foreign for the same period in 1858. In November the total imports were 45,950 qrs.

In peas no alteration has taken place excepting in white boilers, which during the sharp frost found more inquiry, and consequently rose 1s. per qr. Maples, on the contrary, having been more plentiful, with some foreign imports, have scarcely maintained previous rates. The prices of boilers may yet improve should the weather again turn frosty, but low grinding barley and maize are checks upon much advance in those for hog feed. The imports into London for the four weeks were 3,127 qrs. English and 5,579 qrs. foreign, against 1,616 qrs. English and 8,672 qrs. foreign in 1858. The imports throughout the kingdom for November were 31,146 qrs.

The linseed market has still been tight, with a good export trade, though the low price of oil has been against much advance, as well as the high range of prices which has lasted so long. Rates have improved fully 1s. per qr. in the course of the month, and there seems nothing in prospect to lead to the expectation of any early decline. Cakes have continued to sell well, the demand being beyond the necessities of Christmas, partly from the injury done to swedes and mangel wurzel during the frost.

In the seed market but little has been doing. The high pretensions of foreign markets for white cloverseed have somewhat abated, not meeting the views of the trade here, still its scarcity may keep it dear. Red cloverseed has been more in favour, from its low price and the nearness of the season, though as yet there have been but few transactions. The opinion that we have a fair crop of seed in this country is likely to keep buyers on the reserve till the season really opens. Foreign spring tares, beginning at easy rates, say 43s. to 44s. per qr., have found some buyers. Canaryseed has been reduced in value about 2s. per qr., fair quality being procurable at 58s. to 60s. per qr. In hempseed, mustardseed, and the seeds used in confectionary, a retail business has been transacted, at about former rates.

CURRENCY PER IMPERIAL MEASURE.

Shillings per Quarter.

Wheat, Essex and Kent, white new 38 to 48.... old 40 to 50
" red new 37 45 .... old 39 47
Norfolk, Linc., and Yorks., red 37 46
Barley, malting, new .. 34 to 38 .... Chevalier, new 38 44
Grinding .... 26 28 .... Distilling 28 30
Malt, Essex, Norfolk, and Suffolk .... 49 to 57 fine 60 68
Kingston. Ware, and town made .. 49 57 ,, 60 68
Brown.......................... 48 49 — —
Rye ....new — — 30 31
Oats, English, feed .... 20 25...... Potato...... 25 30
Scotch, feed .... 21 26...... Potato...... 25 30
Irish, feed, white .... 20 23 fine 24 28
Ditto, black .... 20 23 ,, — 25
Beans, Mazagan .... 35 41...... Ticks 36 42
Harrow .... 37 46...... Pigeon....... 48 50
Peas, new, white, boilers 36 41 Maple 38 40 .. Grey 34 35
Flour, per sack of 280lbs., Town, Households 37s., fine 41 43
Country .... 31 32 ...... Households.. 33 36
Norfolk and Suffolk, ex-ship 30 31

FOREIGN GRAIN.

Shillings per Quarter.

Wheat, Dantzic, mixed 50 — high do. — 52 extra — 55
Konigsberg.........49 51 ,, — — — —
Rostock ....51 — fine 54 old 54 — —
American, white.. 43 49 red .... 42 47 — —
Pomera., Meckbg., & Uckermrk, red 47 49 — —
Silesian, red ....42 47 white 46 50
Danish and Holstein 46 48
Russian, hard 44 46 .. French .. 40 47 white 44 48
St. Petersburg and Riga 42 47
Rhine and Belgium 44 50
Barley, grinding ....24 27 .... Distilling 29 31
Oats, Dutch, brew, and Polands 22 27 Feed 19 23
Danish and Swedish, feed .. 20 24 Stralsund.... 20 25
Russian 18 22
Beans, Friesland and Holstein...................... 37 42
Konigsberg ....34 41 Egyptian 35 37
Peas, feeding ....35 36 fine boilers .. 37 39
Indian Corn, white ....31 34 yellow 30 32
Flour, per sack ......French 29 36 Spanish .. none — —
American, per barrel, sour. 23 27 sweet ... ,, — —

COMPARATIVE AVERAGES—1858-59.

From last Friday's *Gaz.*		s.	d.	From *Gazette* of 1858.		s.	d.
Wheat	124,600 qrs.	43	8	Wheat	99,187 qrs.	40	2
Barley	92,097 ..	35	1	Barley	98,049 ..	33	11
Oats	12,693 ..	21	9	Oats	11,602 ..	21	10
Rye	149 ..	30	0	Rye	73 ..	32	5
Beans	5,135 ..	41	0	Beans	2,821 ..	41	1
Peas	2,146 ..	38	9	Peas	987 ..	46	5

PRICES OF SEEDS.

BRITISH SEEDS.

Mustardseed, per bush., new 10s. to 14s., brown 12s. to 16s.
Coriander, per cwt.............................. 14s. to 16s.
Canary, per qr.................................. 58s. to 63s.
Trefoil, new.................................... 24s. to 26s.
Tares, Winter, new, per bushel ....7s. to 7s. 6d.
Linseed, per qr., sowing —s. to 60s.. crushing 54s. to 58s.
Linseed Cakes, per ton .... £9 10s. to £10 10s.
Rapeseed, per qr................................ 50s. to 54s.
Rape Cake, per ton ....£5 10s. to £6 0s.

FOREIGN SEEDS, &c.

Cloverseed, red 48s. to 54s............white 84s. to 94s.
Trefoil, ... 20s. to 23s.
Hempseed, small, 33s. per qr........... Dutch —s. to 38s.
Coriander, per cwt.............................. 16s. to 18s.
Carraway ,, ... 36s. to —s.
Linseed, per qr., Baltic 52s. to 56s....Bombay 58s. to 60s.
Linseed Cake, per ton.................. £9 10s. to £11 0s.
Rapeseed, Dutch .... 54s. to 58s.
Rape Cake, per ton ....£5 0s. to £6 0s.

HOP MARKET.

BOROUGH, Monday, Dec. 26.—Nothing doing till the new year.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, Monday, Dec. 26.—An improvement in the prices of the better qualities.

BOROUGH AND SPITALFIELDS.

LONDON, Saturday, Dec. 24th.—Since our last report, owing to the late severe weather, the arrivals of home-grown potatoes have been limited both by land and water carriage, and the receipts from the continent have not exceeded 50 tons. For all kinds the trade is somewhat active, and prices have advanced. Present rates are as follows:

York Regents	90s. to 140s.	per ton.
York Flukes	130s. to 140s.	"
Lincolns	85s. to 110s.	"
Essex and Kent	80s. to 110s.	"
Scotch	70s. to 120s.	"
Do. Cups	85s. to 120s.	"
Foreign	70s. to 90s.	"

WOOL MARKETS.

ENGLISH WOOL MARKET.

LONDON, Monday, Dec. 26.—Since our last report, more disposition has been shown to operate in most kinds of English wool. Holders, generally, are very firm in their demands; but we have no actual change to notice in value. The supply of wool on offer is limited, and higher rates are generally anticipated.

Per pack of 240lbs.				
Fleeces—Southdown Hogs	£18	10 to	£19	10
Do. Half-bred Hogs	18	10	19	0
Do. Kent	17	10	18	0
Do. Southdown Ewes and Wethers	17	0	17	10
Do. Leicester do.	16	0	17	0
Sorts—Clothing, picklock	18	10	19	0
Do. Prime and picklock	18	0	19	0
Do. Choice	17	0	18	0
Do. Super	15	0	16	0
Do. Combing—Wether matching	20	0	21	0
Do. icklock	17	0	18	0
Do. Common	16	0	16	10
Do. Hog matching	23	0	24	0
Do. Picklock matching	17	10	18	10
Do. Super do.	16	0	16	10

LIVERPOOL WOOL MARKET, Dec. 24.

	s.	d.	s.	d.
Laid Highland Wool per 24lbs.	11	0 to	13	0
White Highland do.	15	0	18	0
Laid Crossed do.. unwashed	14	6	17	6
Do. do.. washed	16	0	18	6
Laid Cheviot do.. unwashed	17	0	20	0
Do. do.. washed	19	6	26	0
White Cheviot do.. washed	32	0	38	0

FOREIGN AND COLONIAL WOOL MARKET.

	Per lb.	s.	d.		s.	d.
German, Saxon, and Prussian.	1st and 2nd Elect	3	4	to	4	6
	Prima	2	4		3	0
	Secunda	2	0		2	4
	Tertia	1	8		1	10
Colonial:—Sydney—	Lambs	1	10		2	1½
	Scoured do.	1	8		3	0
	Unwashed	1	1		1	3
	Locks and Pieces	1	0		1	10½
	Slipe and Skin	1	6		1	8½
Port Philip—	Lambs	1	6		2	3
	Scoured do.	1	8		2	11½
	Unwashed	0	11		1	5½
	Locks and Pieces	1	5½		1	9½
S. Australian—	Lambs	1	10		2	1
	Scoured do.	1	1½		2	4½
	Unwashed	0	10		1	3
	Locks and Pieces	0	7		1	1
V. D. Land—	Lambs	1	10½		2	3½
	Scoured do.	1	2		2	10½
	Unwashed	0	11½		1	5
	Locks and Pieces	1	3		1	7½
Cape of Good Hope—	Fleeces	1	2		2	4
	Lambs	1	2½		2	3
	Scoured	0	9		2	7
	Unwashed	0	10		1	3½

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THE FARMER'S MAGAZINE.

FEBRUARY, 1860.

PLATE I.

WEATHERBIT; A THOROUGHBRED STALLION.

THE PROPERTY OF R. M. JAQUES, ESQ., OF EASBY ABBEY, RICHMOND, YORKSHIRE.

Weatherbit, bred by the late Mr. Orde Powlett, in 1842, is by Sheet Anchor, out of Miss Letty, by Priam, her dam by Orville—Buzzard—Hornpipe, by Trumpator.

Sheet Anchor, bred by Mr. Golden, in 1832, was by Lottery out of Morgiana, by Muley, her dam Miss Stephenson, by Scud or Sorcerer, sister to Petworth, by Precipitate. Sheet Anchor was one of the finest and altogether the most promising colts of his time, although he hardly fulfilled this as a race-horse; but he got such stock as Kedge, Sally, Sequidilla, Arcanus, Wee Pet, Egidia, Cable, Britannia, Collingwood, Lightning, The Admiral, Malton, and Weatherbit, and a number of other winners. The country, however, gave him up at the end of his eighth season, and in the autumn of 'forty-four Sheet Anchor was sold to go to Brunswick, leaving some very useful blood behind him.

Miss Letty, a great fine mare, bred by Mr. Orde Powlett, in 1834, ranks as an Oaks winner in the Calendar, and in the Stud Book as the dam of Wee Pet, Weatherbit, Iole, and some half-a-dozen others. On the decease of Mr. Powlett she was sold for 500 gs. to Mr. Sidney Herbert, in whose possession she died from breaking a blood vessel in the Spring of 1851.

Weatherbit is a beautiful dark-brown horse, standing about fifteen hands three inches high. He has a very expressive young-looking head, but rather short stiff ears. He has a heavy crest, a good shoulder, and muscular arms. He is a little light in the girth, and this shows more as the horse ages, from the back and abdomen dropping. He has a good back, famous lengthy, powerful quarters, strong thighs, and capital hocks and feet. He stands on short legs, which are now as clean and straight as when he was a foal. He has no white beyond a small star on the forehead, and a few saddle-marks; and, in fact, evinces every sign of what he really has, a hardy good constitution. Weatherbit has an excellent temper, stands over a deal of ground, and is full of life and vigour—looking fit to carry a Saladin to the wars, or Dick Turpin in his ride from London to York, and to get half-a-dozen more Derby winners. He was painted by Mr. Corbet, at Easby Abbey, towards the close of last year, and the portrait is generally allowed to be a very faithful one.

Weatherbit stood at Newmarket in 1848, at 5 gs. a mare. Subsequently, Sir Edward Gooch, on Admiral Rous' recommendation, gave the Duke of Bedford two hundred for him, and the horse was removed to his new owner's seat, Benacre Hall in Suffolk. In the course, however, of another season or two Mr. Parr effected that wonderful metamorphosis of Weathergage, and the Duke's people were mad to get his sire back again. It was said a thousand outright would have been given, but ultimately the horse went back to Newmarket for two years, at a rental of a hundred per annum, and the use of Oakley, just returned from the Duke of Buccleuch's, thrown into Sir Edward. But nothing very brilliant followed immediately on Weathergage, which Newmarket began to consider but a "chance" horse after all; and Weatherbit's lease out, he reappeared in Suffolk. The following year Sir Edward Gooch died, and in the February of 1857 Weatherbit once more came to the hammer. Mr. Jaques got him for four hundred; avery cheap horse at the money, as it turned out. He went at once to Easby, where he has since continued. Weatherbit had no great opening at first in the stud, but had gradually to prove his real value as a stallion. Still, the first thing out by him, in 1851, was the once despised and afterwards renowned Weathergage, the winner of the Goodwood Stakes, the Cesarewitch, the Wolverhampton Stakes, and some other races at three years old. About contemporary with him came Diomedia, winner of the Riddleworth, Hugo, another winner of the Riddlesworth, and then on to Petrel, Dabchick, Pugnator, Winter, Triton, Eupatoria, Delusion, Keepsake, Kelpie, Memorial, Minnie, Mormon, Pampa, Paula Monti, Saxe Weimar, Stockham, Farmer's Son, Delirium, Lord Berkeley, Luff, Syracuse, Doubloon, and Weathercock, Weatherglass, Weatherwise, Weatherbound, and so on. Drumour is generally thought to be by him; while this creditable list, considering his limited chances, is crowned by a winner of the Derby in Beadsman, a horse that should have run on. The characteristics of the sort are a combination of speed and stoutness, which are easily traceable to Weatherbit's own good looks and pedigree. They can run to win at Newmarket; or, if too readily condemned in that fastidious quarter, can come again, like Weathergage, with Mr. Parr; or run day after day, and hour after hour, under the auspices of Ben Land, or some other such a spoil-sport among the platers. In Suffolk Weatherbit left some very strong, good-looking hunting stock behind him; and a good judge, who saw him at Easby a year or two since, pronounced him to be the best stallion out to get "useful horses."

PLATE II.

A PRIZE BOAR OF THE LARGE BREED.

THE PROPERTY OF MR. JOHN HARRISON, JUN., OF HEATON NORRIS, STOCKPORT.

Carswell the Second, bred by and still the property of Mr. Harrison, is by Carswell, out of Nancy by Cheerful.

Carswell the First—as he is now called, for distinction—was the first prize boar at the Salisbury Meeting of the Royal Agricultural Society, as well as the winner of eleven other first prizes in 1857.

Cheerful, the sire of this boar's dam, was also a winner of eleven first prizes in 1852; so that he is famously bred on both sides.

During the past year, Carswell the Second took the following honours:—

In July—
- The First Prize at the Warwick Meeting of the Royal Agricultural Society.
- The First Prize at the Grimsby Meeting of the North Lincolnshire Society.

In August—
- The First Prize at the Edinburgh Meeting of the Highland Society.
- The First Prize at the Blackburn Meeting of the North Lancashire Society.
- The First Prize at the Halifax and Calder Vale Society.
- The First Prize at the Rosendale Society.

In September—
- The Special Prize at the Manchester and Liverpool Society, at Liverpool.

In September—
- The First Prize at the Stoke-upon-Trent Meeting of the Staffordshire Society.
- The First Prize and a Sweepstakes at the Lyme Park Society.
- The First Prize at the Radcliffe Bridge Society.

In October—
- The First Prize at the Chapelfield Society.
- The First Prize at the Middleton Society.

We, of course, frequently met with Carswell in the course of this triumphant career, and thus spoke of him at Warwick:—"The Judges were evidently well satisfied. There was more meat, and less offal. The large pips, especially, were the 'cleanest' they had seen; and Mr. Harrison's boar was a marvel of size and quality. He was two feet four-and-a-half across the shoulder; he was six feet five in the girth round behind the shoulder; he was smart and active when you had him up; and he was one of the sights of the day. The shearling Southdown, Royal Butterfly, the four-year-old Hunter, and Mr. Harrison's Pig vied with each other for the great honours of the occasion."

Mr. Harrison breeds a great number of pigs annually; and that truest of tests, open competition, has declared them to be of the very best sort. Of course, he has always some on sale.

THE USE OF SEWAGE IN IRRIGATION.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

That an enormous mass of liquid manure is incessantly pouring into our rivers, is admitted by every one. That all attempts have failed to profitably abstract the fertilizing contents of our sewers by chemical means is equally well known; and yet no person with whom we have to do doubts that these outpourings tend very considerbly to the impoverishment of our country. These truths have, during the present century, from time to time been brought before the public. Commissioners of sewers have been warned; sanitary authorities have been implored to remember, and *act* upon these great, these startling facts.

Hitherto, however, but little fruit has resulted from these exhortations. Science has done her part, and done it well; the practical farmer has pointed to the sewage-irrigated meads of Edinburgh, of Clipstone, of Rugby, and of Milan—eminently successful experiments on a noble scale; he has referred to the use of the sewage pump at Rugby, at Tiptree, and in Scotland; but he has pointed out these profitable uses of sewage apparently to the blind and the deaf only.

Within these few days Mr. Mechi has begun a tournament in the same arena, and with all his wonted vigour, and never exhausted zeal and good humour. Baron Liebig, the most eloquent of agricultural chemists, has backed the Alderman with a vivid picture of our national folly, in a letter, to the greater portion of which I heartily subscribe.

It is very true, as the great German chemist reminds his readers, that the exportation of corn, or any other portions of organic matters from a country, tends to render that land less fertile. We need hardly set about convincing ourselves of this truth, by remembering the fate of largely-exporting corn countries. Sardinia, and Sicily, and the African shores of the Mediterranean, once granaries of Rome, the lands even of Northern America—all tell the same tale by their now impoverished condition.

Few of my readers will doubt these facts. All Cheshire knows that that fine county exported the produce of its pastures until it was obliged to have recourse to crushed bones and other fertilizers of a similar composition, to restore to their pastures what their unrivalled cheese had for ages been gradually removing.

But when we admit these important facts, how commonly do we stop short, and omit to remember that, although we do not export corn, yet we send our corn into huge cities, where it is as much lost to the fields of our island as if we had shipped it for another country! We do not send the corn abroad it is true, but we sell it to those citizens who consume it, and then (through their sewers) export all the fertilizing matter the corn produces into the adjoining river, and thence into the sea.

It was after glancing at these nationally neglected truths that Liebig has just reminded us of the impoverishing effect of, thus losing fertilizing matters from any country.

"If it is perceived that no country can perpetually supply another with corn, then must it be still easier to understand that an importation of manures from another country must cease still earlier, since their exportation diminishes the production of corn and meat in that country in so rapid proportions that this decrease in a very short time forbids the exportation of manure. If it is considered that a pound of bones contains in its phosphoric acid a necessary condition for the production of 60lbs. of wheat, that the English fields have become capable by the importation of 1,000 tons of bones of producing 200,000 bushels more of wheat in a series of years than they would have produced without this supply, then we can judge of the immense loss of fertility which the German fields have sustained by the exportation of so many hundred thousand tons of bones which have gone from Germany to England. It will be conceived that if this exportation had continued, Germany would have been brought to that point that she would no longer have been able to supply the demand of her own population for corn. In many parts of Germany, from which formerly large quantities of bone were exported, it has now already come to be the case that those bones must be at a much higher price brought back again in the form of guano, in order to obtain the paying crops of former times.

"The exportation of bones for so many years from Germany was possible only because the German agriculturists had less knowledge of the real nature of their business than the English, believing as they did that practice and science taught doctrines contradictory to each other, and were fundamentally different things, and that they must trust, not in the laws of nature, but in receipts. Things have now changed for the better, although not to the extent which was to be desired, for the German farmers do not as yet generally understand the value of the elements of bones for preserving the present fertility of their fields (not to speak of the restoration of their former fertility), for if they all understood this, no one would sell any more bones —at all events, no more than those which he brings to market in his grain and cattle.

"If the common 'sewerage system' is retained, then the imported manures, guano and bones, make their way into the sewers of the cities, which, like a bottomless pit, have for centuries swallowed up the guano elements of the English fields, and after a series of years the land will find itself precisely in the condition it was before the importation of guano and bones commenced; and after England shall have robbed the cultivated lands of Europe even to complete exhaustion, and taken from them the power to furnish her longer with corn and manure, then she will not be richer than before, in the means of producing corn and meat, but will from time forth become even poorer in these means."

There is no gainsaying these remarks of the German philosopher. Let us rather endeavour to stay this outpouring of the riches of our soil. Let us then inquire what hope there is for the future.

One great difficulty in the utilisation of the sewage is, in the case of London, about to be removed; its drainage has hitherto been pouring into the Thames by a hundred different mouths—these outpourings being commonly situated in densely-populated places, alike difficult to approach, either by chemical operations or by the pump. The great intercepting sewers of the metropolis now in the course of construction will bring the excreta of between two and three millions of persons to two points—one on the northern and the other on the southern side of the Thames, and this at some distance from thickly-populated neighbourhoods. The facilities thus afforded to the use of the pump (and I take it that, in our present state of knowledge, the pump is the only practicable agent) will be very considerable. Either by public companies alone, or by the aid of public grants or sanitary commissioners, this huge mass of liquid manure will assuredly be rendered available.

Let us, then, once again endeavour to diffuse a knowledge of what kind of substance we have to deal with—its chemical composition—its amount—the cost of pumping it from the level of the river (where we find it) to such an elevation as will enable the farmer to lead it by its own gravity over his grass lands. The chemical examination of the excrements of a town population by Professor Way is perhaps the best at present in our possession. He gives as the result of his examinations (*Jour. Roy. Ag. Soc.*, vol. xv. p. 140), that the daily amount of matter contributed to the sewage of a town by each individual (men, women, and children) is ¼ lb. of solid and 3 lbs. of liquid excrement. The solid excrement contains about 75 parts in 100 of water. The dried solid matter contained, in an analysis made in the Professor's laboratory—

Organic matter	88.52
Insoluble silicious matter	1.46
Oxide of iron	0.54
Lime	1.72
Magnesia	1.55
Phosphoric acid	4.27
Sulphuric acid	0.24
Potash	1.19
Soda	0.31
Common salt	0.18
	100

From the mean result of a series of experiments on the urine or liquid portion of the excreta, it is found that this contains about 30 parts in 1000 of solid matter. This solid portion of evaporated urine may be deemed to contain about the following proportions per cent. of different fertilizing substances:

Organic matters and salts of ammonia	67.54
Insoluble silicious matter	0.09
Oxide of iron	0.05
Lime	0.61
Magnesia	0.47
Phosphoric acid	4.66
Sulphuric acid	0.46
Potash	1.83
Chloride of potassium	5.41
Common salt	18.88

The quantity of sewage produced by a town has been estimated by the bulk of the water used by the inhabitants—data which it is needless to describe in this paper. From these we are safe in assuming, with Professor Way, that the smallest quantity of water which is at any time likely to pass through the sewers of a town will be equal to 20 gallons per head of the population. It may be more, but it cannot well be less. Twenty gallons of water weigh 200 lbs.; so that the solid and liquid excrements of each person, containing altogether only about 1,000 *grains* of solid matter, more than half of which is soluble, are distributed through 200 lbs. (1,400,000 grains) of water. In other words, the solid matter of the urine and fæces is mixed with 1,400 times its weight of water. "Here," truly enough adds the Professor, "is the great difficulty of the subject."

There are other sources than these, however, by which the sewage of towns is enriched. In the above calculation only about 50 grains of solid matter might be expected to exist in an imperial gallon of sewage; but the analysis of the flowing contents of the London sewers shows a much larger proportion of solid matter to exist in the metropolitan sewage. In that of the sewers from Barrett's Court (*ib.*, p. 153) 492.26 grains per gallon were present; in that from Dorset-square 209.70 grains. The solid matter from the Barrett's Court sewage consisted of—

Organic matter and salts of ammonia	301.82
Sand and detritus of the granite from the streets	20.69
Soluble silica	12.51
Phosphoric acid	10.44
Sulphuric acid	14.73
Carbonic acid	15.59
Lime	24.53
Magnesia	2.87
Per-oxide of iron and alumina	6.20
Potash	14.13
Soda	1.51
Common salt	33.24
	492.26

Taking the estimate of Way as the basis of our calculation, at least 40,000,000 gallons of this liquid manure daily pours into the Thames. Such, then, is about the average composition of the London sewage, and such the enormous bulk of it which will, before long, be collected at two places on the Kent and Essex sides of the Thames. For those great outlets to be rendered available for irrigation it must be raised by the steam engine and the pump. Two chief questions then arise—(1) the quantity of sewage requisite for the irrigation of an acre of grass land, and (2) the cost of raising that amount of sewage from its level at the sewer's mouth to the necessary height.

As regards the quantity of sewage required in irrigation, there are two ways of obtaining an approximate result—either by the amount of water which a dry soil will absorb, or by ascertaining the quantity actually used in the irrigation of certain long-celebrated water-meads. The first mode was that adopted by M. Schubler (*Jour. Roy. Ag. Soc.* vol. i. p. 182); he found that the real quantity of water in a saturated cubic-foot of earth was as follows:

Calcareous sand . .	31.8 lbs.
Silicious sand . . .	27.3
Sandy clay . . .	38.8
Loamy clay . . .	41.4
Brick earth-clay . .	45.4
Garden mould . .	48.4
An arable soil . . .	40.8

If we calculate the mean amount of water in these seven varieties of saturated soils to be equal to 42 lbs. per cubic-foot of earth, or 378 lbs. per square-yard of soil a foot deep, then 378 × 4840 (the number of square-yards in an acre) gives 1,829,420 lbs. of water needed to saturate an acre of perfectly dry land to the depth of one foot, or about 816 tons. If we suppose that the saturation of the soil need only extend to a depth of nine inches, then about 543 tons of water would be sufficient; if a depth of only six inches, then 408 tons; and if to only a depth of four inches, then 273 tons would suffice.

The second and more practical method of ascertaining the most beneficial amount of sewage necessary for irrigating a given quantity of land, is by reference to the quantity employed at Edinburgh. Here we are fortunately aided by the report of two gentlemen well conversant with the management of those valuable meadows. It appears from the report of Dr. J. Stark ("Statement on Sewer Manure," p. 49), that the celebrated Craigentinny Meads are annually irrigated with the city sewage about eighteen times. For instance: a certain plot was watered in its turn, in 1845, May 3 and 14, June 3 and 20, August 15 and 31, Oct. 8 and 29, Nov. 24, Dec. 31; in 1846, Jan. 30, Feb. 18, March 5 and 22, April 2 and 13.

Now, if we calculate that, on an average of months, 500 tons of irrigation-water would suffice to saturate the soil (always partially and sometimes thoroughly previously moistened), then it would require 9,400 tons of water to give these eighteen irrigations to an acre of land. I deem the quantities I have stated as likely to be an average amount of sewage-fluid required for the irrigation of an acre of grass-land to be nearly correct. In the report of Mr. George Buchanan, engineer to the Irrigated Meads of Craigentinny, to the Commissioners of Metropolitan Sewers, he states the quantity of water necessary per acre (p. 6) to be equal to a stream of sewer-fluid of 3¼ cubic feet per minute for twelve days of ten hours each. Now this I calculate to be equal to 3¼ × 60 × 10 × 12 = 23,400 cubic feet, weighing 62½ lbs. per cubic foot, or 62½ × 23,400 = 1,462,500 lbs., or about 650 tons. It will be remarked, however, that the sewage-fluid in this case had to sustain the soakage, leakage, and evaporation during thirteen days of the month of May. This slow irrigation is far from being the most economical mode of applying the sewage—the more rapid and copious application being to be preferred, as affording little time for the soakage into the substratum and the drains. Mr. Buchanan also adds (ibid. p. 7): "In some parts the soil consists of very stiff clay, resting on a similar substratum, and other parts of a red sand, and the sand requires nearly twice as much water for saturation as the clay."

We see, then, that the amount stated by Mr. Buchanan of about 700 tons per acre having been used at Edinburgh upon a mead, and subject to many deductions from its saturating power, is not very widely different from the average amount of about 800 tons required, according to Professor Schubler, to saturate the same extent of nearly chemically dry earths. Then, again, by avoiding the soakage and drainage waste of twelve days, and taking the average of moderately retentive soils, a very material saving would undoubtedly be accomplished; and, moreover, by raising the sewage-fluid to the contemplated elevations, it would be available for the use of the irrigator a second time. Upon the whole, therefore, we may safely deem the calculated quantity of about 9,000 tons per acre annually to be a tolerable approximation to the truth.

The most economical steam-engines for raising large quantities of water are the Cornish engines; and these will be the engines employed by Commissioners of Sewers, Irrigation Companies, or where land-owners unite in raising sewage on to their lands. But there are more frequent cases where the landholder would be willing to use for this purpose the ordinary fixed engine, now so commonly to be met with on large estates.

Let us, then, examine what amount of sewage an ordinary steam-engine can be expected to raise, by the consumption of a given weight of fuel, to different heights; and then let us enquire what the Cornish engines accomplish with the same expenditure of firing. First, then, as to the power of the ordinary steam-engine. Now, on this head I was, some time since, favoured with a report from Messrs. Ransomes and Sims, of Ipswich. In this they remark: "Probably we shall not be far from an average if we estimate that the small engines used for agricultural purposes will not raise more than 16,000,000 lbs. one foot high by the consumption of 1 cwt. of coals. It must be understood that the same weight of coal will lift half the water to twice the height, or one-fourth the water to four times the height, and so on."

Now, supposing that we have to lift the water from a sewer, or other stream, to the portion of a field which is ten feet above its level, then 1 cwt. of coal will lift to that height one-tenth of 16,000,000 lbs., or 1,600,000 lbs. As a gallon of water weighs 10 lbs., therefore 160,000 gallons will be lifted; or as 224 gallons weigh a ton, 714 tons of water may be raised 10 feet, with the consumption of only 1 cwt. of coal: and this is almost exactly equal to an inch in depth over seven acres, or an average fortnight's rain in the southern and midland districts of England. Or, to regard it in another point of view: supposing that 500 tons of sewage per acre was required to thoroughly irrigate an acre, then, by 1 cwt. of coals, an acre and a half of land can be irrigated.

These facts may be thus tabulated, the calculation being based upon the before-given datum of 1,600,000 gallons:

One cwt. of coals will raise	1 foot	1,600,000 gallons.
„ „ „	2 feet	800,000 „
„ „ „	4 „	400,000 „
„ „ „	8 „	200,000 „
„ „ „	12 „	133,333 „
„ „ „	16 „	100,000 „

But let us see how far more than this the great Cornish engines accomplish, with the same expenditure of fuel, these engines being especially adapted to the pumping of water, and every appliance adopted to economise fuel.

Now, from the average work of twenty-five of these fine engines, reported a few years since, it appears that by the consumption of

One cwt. of coals they raised	1 foot	6,200,000 gallons.
„ „ „	2 feet	3,100,000 „
„ „ „	4 „	1,550,000 „
„ „ „	8 „	775,000 „
„ „ „	16 „	387,000 „
„ „ „	32 „	193,500 „
„ „ „	64 „	96,750 „

So that we see, by these tables, that a Cornish engine will raise about 96,750 gallons (or say 380 tons) to a height of 64 feet; that an ordinary engine can only lift 16 feet; and if we calculate that so large a quantity as 9,000 tons of sewage are needed for the most profitable irrigation of an acre of land, and that this amount has to be raised 64 feet, why then the expenditure for coals would be, in a Cornish engine, about 24 cwt.; if the lift is 32 feet, then only about 12 cwt. would be required.

From an obliging communication, dated January 21, 1860, from Messrs. Sandys, Vivian, and Co., of Hayle, in Cornwall, I find that the average work, or "duty" of the great Cornish engines is not quite so much as that reported of the 25 engines. These great engine makers observe, "we find the average duty of our large Cornish pumping engines is about 52,000,000 lbs. of water, (or 21,666 tons.) lifted one foot high by 112 lbs. of Welsh coals."

112 lbs. of coal would therefore raise . . .	8 feet	2708 tons.
Ditto . . .	16 „	1354 „
Ditto . . .	32 „	677 „
Ditto . . .	64 „	338 „

It is most probable that the quantity of sewage which I have supposed requisite considerably exceeds the amount that will under the best management be found sufficient.

In irrigation with ordinary streams, the purer the water the more copious is the amount that the irrigator finds necessary. We learn from Mr. Coombes, of Tisbury, that the quantity of the bright chalk or oolite waters of Wiltshire, which the irrigated meads receive, is on an average about 2,000 gallons a minute. And yet we are all pretty well aware that a much smaller quantity of a richer liquid manure spread over grass land is productive of highly-beneficial results. Let us briefly refer to what Mr. J. Bruce, of Ensham, reports (*Jour. Roy. Ag. Soc.*, vol. xiv. p. 432). By his mode he finds fifty or sixty hogsheads of a mixture of pond-water and liquid manure sufficient to flush an acre.

And then if we inquire the result of using on a large scale a mixture of river and sewage waters, where can we refer better than to the case of the meads around the city of Milan in Northern Italy? Of these celebrated meadows we have the advantage of a report from the English Government Commissioners—a digest of whose statement I have elsewhere printed (*Farmer's Almanac*, vol. ix p. 31). By these Commissioners (Messrs. Way, Austin, and Southwood Smith) we are informed, these valuable water meads surround the city on all sides. The river Vettabia, which carries away the liquid refuse of Milan, is made to irrigate about 4,000 acres before it falls into the river Lambro, about 10 miles from the city; the amount of water flowing from the town equals 160 gallons per day for each inhabitant; the depth of water conveyed on to the land, calculated over the whole area, is about 8 feet yearly (9600 tons). This, it is calculated, contains the liquid refuse of about forty persons. A large portion of the water, however, is used over again on fields of lower levels. No where, it seems, is the water of the Milan river as muddy in appearance as that of the Thames at London Bridge, and yet a large portion of the land irrigated with it becomes so rich that the surface is pared off every few years, to obtain the vegetable matter (which gradually becomes too luxuriant) as manure for other lands, for which it is highly prized. The expense of forming a water meadow varies from about £8 to £10 up to £40 an acre, according to the nature of the original surface. The water during the summer months is turned on to the grass from six to ten hours about once a week; but a certain portion of these meads, called marcite, are constantly irrigated by having a thin film of the water passing over them. This flow is never stopped except in crop-cutting time. These marcite meadows require about 250,000 gallons of water per acre; but then the water is afterwards employed on other meadows. The farm of Dr. Chiappa, of about 580 acres, is about 3½ miles from the city. Here are about 80 acres of marcite; the produce of these 80 acres supports 100 stall-fed cows. Six crops of grass are cut during the year, of the following proportion of weight. In—

February,	800	kilogrammes per pertica.
April,	800	„ „
June,	600	„ „
August,	600	„ „
October,	400	„ „
December,	400	„ „

or about 22 tons of grass per acre per annum. Hay is made in June and August. On hay the cattle are fed about forty days in the year—at all other times on fresh grass only. In judging of the produce of these meadows, the effect of the climate of Italy must be regarded. Let us then compare the climate of Milan with that of Edinburgh, where are situated the greatest sewer-irrigated meads of our island.

If we place in juxtaposition the recorded observations of the meteorologist, we shall find that the climate of these places hardly differs so widely as we might expect (and in the southern portion of our island the difference would be still less).

The following table gives—I., the mean temperature; II., the average depth of rain, in inches; III., the average number of days on which rain falls in Northern Italy and in Scotland:

	Lombardy.			Scotland.		
	I.	II.	III.	I.	II.	III.
Winter . .	36.1	8.9	13.3	39.6	5.6	31
Spring . .	55.0	9.3	9.8	46.6	6.4	32
Summer .	72.8	9.2	3.3	58.0	9.3	37
Autumn .	56.3	11.8	11.7	48.6	9.6	35

But to continue my abridgment of the Commissioners' Report. It appears that no manure is used on the foul-water-irrigated land, the manure of the cattle fed with its produce being used elsewhere. On all the lands irrigated with plain water, a large quantity of manure is at all times used. To obtain the same amount of produce from such lands as are here watered by the Vettabia, it is calculated, would require an annual amount of well-decomposed manure equal to £4 8s. per acre. The general conclusions to which the Commissioners arrived were seven—1. That this is the most extensive of applications of diluted sewage to irrigation. 2. That the experience of the irrigations around Milan adds a striking additional proof to those already obtained, of the great value to agriculture of a command of pure water alone, and of the immense increase of that value obtained by the addition of sewage, combined with the higher temperature derived by the liquid in its passage through a town. In their third, fourth, and fifth conclusions, they advise the previous deodorization of English sewage, before the clear liquid is used in irrigation. 6. That the risk of injury to the health of the population living immediately in the midst of the Milanese irrigations, is only such as arises elsewhere from the similar use of large bodies of water; that no increase of disease whatever is traceable from the application to the land of the waters of the Vettabia, in which the sewage of Milan is conveyed, notwithstanding the much higher temperature of the climate, and the greater evaporation than is experienced in this country. And, 7th, they express their opinion of our "folly and extravagance" in adopting expensive arrangements for throwing so valuable a material away.

The right to all running waters, it seems, belongs, in the Lombardo-Venetian Kingdom, to the Government, by whom it is regularly leased for the purposes of irrigation. In our country the sewage of our towns, far exceeding in fertilizing effect the waters of the Milanese, is invested by law in the Commissioners of Town Sewers. There is, therefore, no reason why they should not lease it for similar purposes. Surely it would be well (rather than wastefully polluting the Thames with it) if the Metropolitan Commissioners were to cause the collected sewage of (for instance) the northern portion of London to be raised from its proposed outfall on to the side of the Essex slopes, and then directed, by means of partially-covered but generally-open channels, towards the sea. There are thousands of acres of marsh-land on the sea-coast of Essex, near the mouths of the Thames and the Crouch, very admirably adapted to absorb the whole sewage of the Metropolis. As this sewage would be readily leased by the owners of those extensive marsh-lands, a considerable revenue would be raised in this way. And in an affair like this, of national importance, surely, for the construction of the necessary channels, &c., a parliamentary advance might be obtained, at a very low rate of interest. The expense of pumping on a large scale, with the Cornish engines, is so small that, however large the demand, it could, at a sufficiently low rate, be readily furnished; and moreover, in need, the great irrigation channels could be flushed, or their contents diluted with the rich waters of the Thames.

That these rich streams of fertilizing matters cannot be much longer allowed to be wasted, there is no difference of opinion amongst those with whom we have to contend; and every one appears to believe that it is an effort that must at no very distant day be successfully made. It is one that, in such a case as the pumping of the sewerage of a huge city, can hardly be made by any private individual. It ought to be accomplished, in the first instance, perhaps, either by a public company or by the Commissioners of Sewers; and in either case, as I have before stated, for that purpose, a parliamentary loan would prove of great public advantage.

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

General Meetings are taking quite a new turn. It is no longer the merely formal cut-and-dried business that was once the etiquette of such assemblies. In those halcyon days half-a-dozen Directors and a Secretary made up the show. They passed mutual compliments from one to the other, unanimously agreed to the most agreeable of resolutions, and perhaps finished by fishing up some modest retiring shareholder or subscriber to propose a vote of thanks to everybody, and for everything. But times are terribly changed of late. The shareholder, or subscriber, or ordinary member is by no means so modest or retiring now. He begins to feel it to be quite a positive duty to kick up a row, and to put awkward questions. When evangelical secretaries are systematically helping themselves; when charitably-disposed bankers are borrowing other people's plate; and when highly-respectable solicitors are maintaining this respectability on their clients' title-deeds, some little vigilance may be really requisite. When flourishing Companies are paying an unprecedented per cent., by the simple process of taking the dividend out of the capital; and when insolvent Companies, like unwelcome guests, are still continuing to make their "calls" for the working expenses, it may behove the too-gentle public to bestir himself. And he does so with a vengeance. He considers the Directors as certainly no better than they should be. He would like very much to know what the Chairman does for his money? And, whether the policeman at the corner of the street has had proper instructions to keep his eye on the Treasurer? He does not quite see why he should not be a President or a Manager himself, and so eventually moves that the fees and salaries of everybody be diminished until he comes into office. In a word, it is his right to find fault if he so chooses, and he will be unworthy the name of an Englishman, or the claim of a shareholder should he neglect to exercise so glorious a privilege.

In plain truth, the thing may be easily over-done. The fair fame and good uses of many a public body have been frittered away, ere now, by a factious opposition, that fancied it alone was independent, simply because it was always in a minority. In too many of such cases personal pique and jealousy have been the actual motives; while a "public duty" has, of course, figured as the stalking-horse. Wholesome agitation has degenerated into the most direct and bitterest enmity. Self-constituted patriots are seen to be the fiercest of partizans, while their ill-directed efforts too generally but injure that body they would profess to save. The Highland and Agricultural Society of Scotland threatened to come to this. No one can have studied its history for the last year or so, without seeing that ill-feeling and dissatisfaction were continually encouraged in certain quarters. The most trivial matters were seized upon, in order to create further differences and difficulties. Some gentlemen went so far on their dignity, and would seem to have been deprived of so much of it, as to have really had very little left. Everything that could be misconstrued into telling against the Society was subject to this acceptable interpretation. The best of management was cavilled at. The undoubted success of meetings was questioned. Hundreds and tens of hundreds of members who were of one way of thinking were "just" a clique and coterie, and the ten or twelve gentlemen who thought the other way the representative wisdom of Scotland. Anonymous assailants were singularly bold in the charges they advanced, and proportionately careful as to not standing any further answerable for them. Chaos and disruption were clearly the watchwords of such a rally, and under these encouraging auspices the Highland Society promised to go to the bad as fast as it could.

Fortunately for one of the oldest agricultural Institutions we have, there has of late been a palpable re-action. So long as reform and improvement were kept to their legitimate objects it is not too much to say that the majority have fairly gone with these endeavours. But it has been more and more impossible to disguise the something beyond this, and the good sense of the Society has at length stepped in to its own rescue. The half-yearly meeting was held at Edinburgh on Wednesday, Jan. 18. It was no such a general gathering as that of our own English Society in Hanover-square, when some forty or fifty may be closely counted up. But "the Museum was densely crowded in every part, and there could not have been fewer than three hundred members present, including the leading proprietors and agriculturists of the Lothians and the adjoining counties." The business commenced with the election of upwards of a hundred and fifty new members. So auspicious an opening was not seriously interfered with. There was altogether a good tone about the Meeting. The majority were evidently determined not to encourage petty squabbles or personal antipathies. The re-election of the Directors and the office-bearers proceeded calmly enough; but, on the abstract of accounts being put in, Sir John Forbes went at once to the expenses of the official establishment, or, in other words, at the Secretary. Curiously enough, Sir John, it appears, was for many years Treasurer to the Society, and one of those who settled what the salary of the Secretary should be *previous* to the present holder of that office being appointed to it. After all, this is but five hundred a year, not such "a great deal more than the Secretary of the English Society got." In fact Mr. Hudson was receiving five hundred at the time of his decease. Nothing, under the circumstances which have lately occurred in Hanover-square, could have been more unfortunate than any comparison with how the Secretary got on there; and yet Mr. Hunter referred to a letter in the *Times* of Tuesday, that went to this very point. Being strictly one-sided, and clearly written to injure one man, this letter was of course anonymous, and it is only extraordinary how in such a guise it could ever have been admitted into any public journal. As the Duke of Buccleuch well said: "It would have been much better if the person signing himself 'A Scottish Farmer' had given his name, or publicly avowed that these were his opinions and sentiments, which would have given some weight to what he stated, instead of giving this stab from behind under an anonymous signature. All he could say was that he could not wish to have the friendship or acquaintance of any man who had not the manliness publicly to state his opinions." The meeting did not evidently believe in the self-dubbed "Scottish Farmer's" alias, and even when backed by Sir John Forbes and Mr. Hunter, his purpose came to nothing. The endeavour to disparage the success of the Edinburgh Show had as untimely a fate. As usual we were present, and we may quote the opinion we recorded of it at the time:—"Never, perhaps, has such an occasion passed off so well, or with so much general satisfaction. The business of the week was not marred by a single mischance or dispute, and a certain desire to march with the spirit of the times was clearly observable." In honest truth the Highland Society never stood so well as it does at present. It has now annual meetings—in place of biennial or triennial—year by year better in their arrangement and stronger supported. The agriculturists of Scotland, as was proved by the Statistics Collection, make themselves almost to a man answerable for its prosperity and proper influence. It has a far larger capital than any other Association of the kind; an amount of means, in fact, that might be more actively dealt with. The Direction is clearly evincing a desire to improve and extend. Almost habitual practices and proceedings have already been amended, and there is every promise of yet further advancement. In the face of this there is still an unfair spirit of hostility displayed that can be traced, we fear, to nothing better than petty jealousy and disappointment. There are members of the Society would like nothing so well as to "put down" the Edinburgh Show as a failure. We repeat, that it was in every way one of the most successful that has ever yet been celebrated.

We shall have, however, to quote ourselves still further, on this meeting. If not marred by a single dispute, it resulted in two or three objections, one of which we foreshadowed at the time. In our estimate of the shorthorn classes we went on in this wise: "The cow Volga, that separated Mr. Douglas' two, also beat Rose of Sharon in Ireland; and has so been first at the Irish, second at the Scotch, and third at the English meeting. She was bred by Mr. Stewart, of Southwick, and is not only very useful-looking, but very well bred, going back to the famous Cherry tribes. Mr. Stewart, however, could not get her to breed; and she was sold as a butcher's beast. But she has since been frequently exhibited, as well as objected to as not being a breeding animal; although now at eight years old, *she has a calf by her side.*" In fact, it was the general impression on the ground that the calf was not Volga's own, although every one naturally supposed it had been entered as such. The mystery was thus cleared up at the Meeting on Wednesday: "The Secretary said the protest referred to by Mr. Wemyss had been sent in too late, but the matter had been fully inquired into; and, if it was the desire of the Meeting, he would state what took place in reference to that case. He then read a memorandum which had been drawn up in reference to this. It stated that Mr. Tod entered a shorthorned cow in section four, and, according to the usual practice, without stating whether she had calved or was in-calf. The animal was exhibited with a calf at her foot, but there was no evidence that the calf was represented to have been hers. After the termination of the Show, the Secretary received a letter from a Member of the Society, complaining of the award in respect that the calf was not the cow's produce, and that she had not had a calf. Mr. Tod, on being called upon to explain the matter, stated that the calf was not the produce of the cow, that it had never been represented to be so, and it had been put to her to retain milk, which he had found upon her. He had entered the cow at the time in the belief that she was in-calf; but, having found it not to be so, he withdrew her on the 29th November. The whole matter was referred to a Committee, who reported to the Directors that there was not sufficient evidence to establish deception and to warrant expulsion. To this the Directors adhered, for the following reasons: 1st. The original entry contained no mis-statement. 2nd. There was no averment that Mr. Tod had represented the calf to be the produce of the cow. 3rd. It was impossible to disprove Mr. Tod's statement that he believed the cow qualified for exhibition as being in-calf at the time. The Directors had, however, resolved so to amend the regulations with reference to cows as in future to prevent animals which have never had calves being exhibited under the pretext of being in-calf. Mr. Gulland, Wemyss, thought the punishment was a very poor one, and that the exhibitor ought to have been expelled. The Chairman said that nothing could be proved against the exhibitor."

Surely the opinions of the Judges should have been taken previous to the Committee or the Directors arriving at a decision. When they gave Volga a prize, was it with the idea that she was in calf? Or that it was her own calf at her side? And, should it not have been clearly stated to them that it was *not* her calf? When, they might have looked to the matter of milk, as well as to the probability of a cow barren up to eight or nine years old ever having any produce. As it is, some other exhibitor has been clearly deprived of a prize. The Judges at the Scotch meetings do not, we believe, as yet follow the English plan, and place a fourth animal; so that in this very class the Society will save both its first and second prizes. Venus de Medicis, the first prize, we hear, is not in calf, neither is this cow of Mr. Todd's; while Rose of Sharon will not take higher rank on the disqualification of those above her. Volga, of course, will also lose the premiums both in England and Ireland. The subject itself is one that manifestly demands a deal more investigation. Was the calf that accompanied her put there under false pretences, or not? Did the Judges at Warwick and Dundalk deal with it as her produce, or not? And is Mr. Todd an injured man, or an offending one? The cow was entered at Warwick as "in milk and in calf." Did the Judges take any especial pains to ascertain if she was either, or did they pass the calf at her side as sufficient qualification? The question should be settled far more definitely; for, if not cleared up, the taint will never wear off. There is not an exhibitor, who has ever played tricks with his stock, but is a marked man to this hour. We are induced to give the Highland Society credit for going the right way, but in this case they have not gone far enough. The explanation should have been *offered*, not extracted, and the whole inquiry must be published in full in the next number of the Society's Journal. It will be a case full of instruction for the public and the Judges—what questions they are to ask, and what they are to look for, as the signs of a breeding animal? How long an old, barren cow can be in milk? And to what absurdity the over-feeding system can be carried? It seems to be really getting topsy-turvy already, when we find Colonel Towneley's cow in calf the finest fat beast at the Smithfield Show, and Mr. Todd's barren one a prize animal at Warwick.

HIGHLAND AND AGRICULTURAL SOCIETY.

The half-yearly general meeting of the society was held in the Museum on Wednesday, Jan. 18. There could not have been fewer than 300 members present. The Duke of Athole, as president, occupied the chair.

The list of gentlemen proposed to fill up the vacancies among the office-bearers and directors was adopted.

Sir W. Gibson-Craig, as hon. treasurer, laid on the table the accounts of the society, of which an abstract was circulated at the meeting.

The Secretary reported that the arrangements for the Dumfries show this year were in a forward and satisfactory state. He also reported the proceedings taken in reference to the Perth Show in 1861, and stated that there was a correspondence going on with influential gentlemen which gave them the prospect of having a meeting in Kelso in 1862. A report by the directors was then read, recommending that the views of the special committee should be permanently given effect to, except in the following instances:—1st, that the premiums for sheep should not be reduced; 2nd, that separate premiums for Galloway cattle should not be given at northern shows, unless a certain number of animals were entered; 3rd, that the 1st of January instead of the 1st of October should be the period assumed for determining age; 4th, that the judges should be selected, not by popular election, but by the directors.

The report of the directors was unanimously approved of.

Mr. Forbes Irvine intimated that the following awards had been made last year: 1. The gold-medal to James Duncan, Old Manse, Denholm, Hawick, for report on the natural history of the turnip-fly. 2. The gold-medal to James Fulton, Temple, Maryhill, Glasgow, for a report on the cultivation of Italian rye-grass. 3. The gold-medal to James Porter, Monymusk, Aberdeenshire, for a report on the top-dressing pasture. 4. The gold-medal to Robert Scot Skirving, Campton, East-Lothian, for a report on the cultivation of mangold-wurzel. 5. The medium gold-medal to Patrick Sherriff, Haddington, for a report on the new variety of wheat.

On the motion of the Duke Buccleugh, the thanks of the meeting were tendered to the Duke of Athole for presiding.

ECONOMY OF FEEDING MATERIAL.

A rather deficient crop in some places, with damaged mangolds in others, is naturally giving rise to discussion on the economy of keep for live stock. The subject at all times is an interesting one; but doubly so under the circumstances now experienced. And what makes it all the more so is the rapid progress which science is making in this department of husbandry. Add to this the price of corn of every kind, on the one hand, together with oilcake and other feeding stuffs, and on the other hand the price of butcher-meat and dairy produce, and it will be seen that very little will turn the balance either the one way or the other in the marketing of produce.

The question of economy, to which we propose confining our observations at present, is not as to whether it would pay the farmer best to give his corn to his cattle, or send it to market, but how to make the most of a given quantity of food. In other words, to make the greatest quantity of the best quality of butcher-meat and dairy produce from a given quantity of food such as the farmer may have at command. The produce of one farm or district often differs widely from the produce of another as to its nutritive value; and so do the crops of different seasons; much depending, in every case, upon how the lands are cultivated and the crops harvested. And these differences are not satisfactorily accounted for by any of the analyses furnished by chemists; so that farmers cannot ascertain the feeding qualities of their crops by sending them to the laboratory. Greater progress must be made in chemistry before science can furnish him with the information he thus wants; consequently he has to be guided by the voice of experience. Chemistry gives so much, but not the whole; and it is the information which experience has to furnish that gives to the subject its peculiar and interesting character, owing to the diversity of practice and the difficulty of deducing from it any standard rule.

It is very clear, then, we cannot commence our subject by telling our friends in the provinces how they are to feed their cattle, in all the details of the most successful practice. It is also manifest that something requires to be said in order to get science and practice to pull together in the investigation of so important a work. If the farmer performs his part of the task at the homestead, and he is daily experimenting there, science should perform hers in the laboratory. If the successful solution of the question or performance of the work is thus depending upon the reciprocal discharge of respective duties, how much has each got to do? and in what order should they be discharged?

We are apprehensive that more is expected of chemistry in this matter than is due. In the examination of our subject practically at the homestead, we find many more branches of science involved than chemistry; for fine symmetry and a fine handle have more to do with the economy of food than the elementary substances usually found in the analyses of our agricultural chemists, "such as starch, sugar, pectine, gum, oil, nitrogenous compounds, and certain mineral matters," because the economy of these very substances depends upon those two conditions. With this every successful feeder is familiar. It was a knowledge of this that gave rise to the improving of the breeds of all our domesticated animals, and which induces breeders to give the long prices they do for superior specimens of every breed. Yet, with all our improvements, there are great differences between the quantities and qualities of butcher-meat and dairy produce yielded by different animals from equal quantities and qualities of food. In other words, we waste the manufactured article nearly as fast as we make it, and then grumble at the amount of raw materials consumed!

From a scientific point of view, fine symmetry is synonymous with fine mechanism; and a fine handle with fine health, or the absence of disease. Science has thus two topics to discuss in relation to the economy of food; the one mechanical, and the other medical.

As to the importance and value of fine mechanism, we have only to compare our thorough-bred Dukes and Duchesses with some of the old jumbling, jarring machines that stilt and totter upon their "rocking levers" about our homesteads, to be able to account for no small share of the differences mentioned above. The implement maker is familiar with the necessity of attending to all the minutiæ of detail in the construction of his engines and machinery; material must be sound, and without a flaw; calculations perfect; and the whole of the working parts well oiled and harmonizing together. If anything diverges but a "hair's breadth" from the truth, more steam is consumed or less work performed, while the tear and wear upon the machinery and the quality of the work done are both against the owner. As it is in this case, so is it in the other—results in both being against the bad-going machine. And here it must be borne in mind that animal mechanism involves other considerations than locomotion; for those displayed in respiration, digestion, and the other mechanical functions, have more to do with the economy of food than the articulation and configuration of the quarters. It is to this wonderful display of mechanism within, that Science directs special attention in the investigation of the influence it exercises in different animals upon the economy of food, and when the whole is seen in this light, and the mutual dependence of parts upon the successful performance of the work of each, properly understood, there will be no difficulty in accounting for the fact why the one class pays more for its keep than the other, both being equally healthy and equally fed.

From a medical point of view, live stock presents, perhaps, a greater diversity of health than mechanism. Now, according to the well-known maxim in this branch of science, "*Every case must be its own rule;*" so that by this rule the economy of food has to be calculated by the degree of health enjoyed in every individual case. And this just agrees with another dietetic proverb, "One man's meat may be another's poison:" "Quod cibus est aliis, aliis est acre venenum." In the case of fine health and fine mechanism, when the food is of the best quality, and everything going on well, there is a daily waste upon the body, requiring food to repair it, besides what is directly consumed in supporting animal heat and vitality. In other words, the balance-sheet, like all other balance-sheets, has a Dr. and Cr. page; so that it is the difference between the two which indicates the increase of weight, or profit, to the farmer in payment of his labour and keep. If the increase of weight is two pounds daily, then the quantity of food assimilated and worked up into the living organism exceeds the daily waste upon the body by two pounds. In bad health the waste upon the body increases; so that if this increase amounts to two pounds daily, there will be no increase of weight, supposing the food consumed, digestion, assimilation, and the other conditions as before. This, however, is never true; for, with bad health, all the functions become less or more deranged, so that there is a waste both of body and food. In the case of draught animals and milch cows there will, under bad health, be less work done, and milk yielded, than in the case of good health; every individual example presenting its own peculiar result, as its amount of profit or loss, according to the degree of health enjoyed.

Without going farther into the details of this division of the subject, the conclusion obviously forces itself upon our notice, that more attention must be paid to the general health of stock and to the medicinal properties of food than is now being done, so as to effect its economy, and return the farmer more profit. It will be understood that we are not finding fault with what has been said or done in reference either to experiments made in the laboratory or at the homestead, *our object being progress in medical chemistry and animal mechanics in their relation to the economy of food.* In every branch of science rapid progress is now being made. A truth so conspicuously exemplified cannot be denied; but, while this is acknowledged, it is equally manifest that practice is advancing more rapidly, and is at the present time a-head in the application of medical chemistry to the economy of food for cattle; and this is not exactly as it should be, for the farmer and agricultural chemist should both pull together in this important work, so as to throw the necessary amount of light around them, and thus prevent the chariot-wheel from running against much opposition now experienced in the cattle-food trade.

The principles which we thus contend for, and have so long advocated in the columns of the *Mark Lane Express*, are acknowledged established in medical science, not only in reference to man, but, if possible, also more so as applied to the brute creation, so that the only topic which can give rise to a diversity of opinion is, the mode of carrying out those principles successfully into practice. When animals are left to themselves, they are led by instinct to search for certain plants possessing both alimentary and antiseptic properties, the one for nourishing the body, and the other for counteracting the daily waste upon it; so that Nature herself leads the way in the march of improvement. Other plants are not only food and medicine, as above, but the alimentary substances which they possess are in a state more ready for digestion and assimilation than are the alimentary substances of the ordinary produce of the farm, while they supply alimentary substances of which that produce is deficient, and which, consequently, must generate disease.

We then come to the practical question, Can Art supply those articles at a price which will enable the farmer to use them profitably? And to this, Experience, already corroborating the soundness of Nature's rule, replies in the affirmative—if they are used successfully. Like all other simple experimental questions, profit depends upon judicious management; and if condiments are of the proper kind, and successfully used, the improvement of health, and consequent reduction of waste upon the body, will leave a balance, as increase of weight in the case of fattening animals and animals being reared, and increase of milk in the case of milch-cows, amply sufficient to cover a much higher price than, we presume, is generally credited as possible.

In saying so, it must not be assumed that we are advocating what may be termed extravagantly high-priced condiments, but the contrary, for we are not so short-sighted in this matter as not to perceive that the longer the profit of the manufacturer the sooner the market will have an abundant and overflowing supply—the legitimate way, according to commercial science, of lowering price. What we wish chiefly to impress upon the minds of our readers is the fact, a well established one too, in all similar cases, that the profit of the farmer depends as much upon his own conduct as upon the quality of the condiment and its price, so that in every experiment, if the balance is against the experimentalist, the first thing he has to determine is the soundness of his own judgment in the selection of the article, and in its proper use in the individual case at issue. To conclude that the condiment is too dear because he has failed to make it pay, is absurd; for if he uses a condiment to effect any of the above conditions regarding quality of food, digestion, assimilation, and health, the balance is so greatly in favour of good management as to do far more than cover the highest priced article now in the market, supposing such article suitable to the pathology of the animal that gets it. Questions of this kind are always most successfully illustrated by example; so that if two farmers have two animals of one breed, similar in every respect, subject to a daily waste equal to the whole amount of assimilation, so that no increase of weight is gained—then, if both use the same kind of condiment, and an equal quantity of it daily, and if the one, by good management, succeeds in reducing this waste upon his animal one pound or two pounds per day, and the other fails to make any reduction through something wrong in the management, has the latter any right to conclude that he himself is right, that the condiment is an imposition, and that his neighbour is being imposed upon? The duty of the latter is unquestionably to improve his practice, until he succeeds in reducing the daily waste upon his own animal, so as to realize a profit equal to his neighbour's. Because one farmer cannot make a profit, that is no reason why the whole should relinquish their profession, placing the plough upon the shelf.

The substance of the whole matter may thus be summed up in one word—HEALTH. What is it? A great deal is said about laying on fat. So far well; but ought not something to be said also about pulling down the fabric? When the water bursts through the mill-dam, the miller, without much theorizing on the subject, hastes to fill up the gap and prevent the waste of what he has been careful to gather. His conduct is as sound in theory as it is effective and exemplary in practice. If Manchester were to burn her web at the one end as fast as she wove it at the other, she would be wasting something more than the raw material. And this is not more than true in the whole than it is in part, for bad health is just any degree of waste upon the body beyond that of the minimum standard of health.

London, Jan. 18. W. BURNESS.

FEEDING STATISTICS.

SIR,—Agriculturists have been called upon to believe that great discoveries have recently been made in the science and practice of the feeding of animals. To use the words of one of the most notorious of the new lights on this subject:—"The manufacture of an alimentary and condimental compound for the seasoning of the food of live stock, is one of the most important advances in applied science which the pen of the agriculturist has to record."

Being largely interested in the feeding of stock for profit, and having devoted a great deal of time and money in inquiries to obtain fixed data relating to the feeding of animals, the conclusion to which I have arrived is, that no proof has yet been given that these new foods have any practical value whatever in an economical point of view. Nor does a knowledge of the composition of these foods add anything to what was previously known on the subject of feeding.

To enable those who are practically engaged in feeding stock to judge for themselves what profit they are likely to derive from the use of food costing from £40 to £50 per ton, I propose to call attention to a few facts connected with the subject of feeding which have been established by the results of my own experiments.

The first question to consider is, what is the probable amount of saleable increase, or meat, that may be calculated upon as the produce of a given amount of ordinary good fattening food? The second is, what is the probable value of the manure? In offering a very few brief observations on these two points, I shall not attempt here to give any exact estimates of the comparative feeding properties of different foods, but merely state the average quantity of ordinary mixed foods of recognised good quality, required to produce a given amount of gross increase or of carcass weight. I shall, however, give estimates of the comparative value of the residue remaining for manure, from a given weight of a number of the most important of our stock-foods.

If feeding experiments are conducted over a sufficiently long period of time—if they include a sufficiently large number of animals to neutralize the influence of individual peculiarities, and if they are in all other respects performed with sufficient care, results will be obtained from which there would be but little deviation whenever the experiment was repeated. Results so obtained may be expressed in a few figures, which, for all the practical purposes of general estimates, may be safely taken to represent the average result of well managed stock-feeding.

My own experiments show that oxen and sheep, fed liberally upon good fattening food composed of a moderate proportion of cake or corn, a little hay or straw chaff, together with roots or other succulent food, will yield over a considerable period of time, one part of increase in live weight, for from eight to ten parts of dry substance supplied in such mixed food. The quantity of dry substance of food required will vary between these limits according to the exact character of the food and other circumstances; but nine parts of dry substance of food, for one of increase in live-weight, may be taken as a very fair average result for oxen and sheep with good food and good management. The dry substance of the fattening food of pigs contains much less indigestible woody fibre, and a larger proportion of assimilable constituents than that of oxen and sheep, and in their case one part of increase in live-weight should be obtained from the consumption of four to five parts of dry substance in their fattening food. By the "*dry substance*" of food is meant that portion which would remain after driving off, by a suitable heat, all the water which in their natural state they contain. For practical purposes it may be assumed that oil-cakes and foreign corn will, on the average, contain rather less than one-seventh, and home-grown corn, hay, &c., rather more than one-seventh of their weight of water, the remainder being the so called "*dry substance*" of the food. In the same sense the commoner sorts of turnips will, on the average, contain more than nine-tenths, and swedes, mangolds, and &c., less than nine-tenths of their weight of water, the remainder being dry substance. Potatoes consist of about one-fourth dry substance and three-fourths water. From these data the farmer will be able to judge for himself whether or not he gets a proper increase in weight of live stock for the food consumed; and from comparative experiments he can decide whether or not he gets an adequately greater rate of increase by mixing with his other food some of the mixtures offered to him at £40 or £50 per ton. To aid him still further in his calculations on this point, it may be stated that owing to the fact that during the fattening process the saleable carcass increases very much more rapidly than the internal and other offal parts, it may be reckoned that nearly 70 per cent. of the gross *increase* of oxen and sheep fattening over a considerable period of time will be saleable carcass. Calculations of a similar kind in regard to pigs show, that of their *increase* in weight whilst fattening, little less than 90 per cent. may be reckoned as saleable carcass.

So much for the means of estimating the value of the increase in live-weight of fattening stock. I now turn to the question of the probable average value of the manure obtained from the consumption of different descriptions of food.

The valuation of the manure resulting from the consumption of different foods is founded upon estimates of their composition, and upon a knowledge, experimentally acquired, of the probable average amount of those constituents of the food valuable for manure, which will be obtained in the solid and liquid excrements of the animals. In the estimates of the value of the manure from different foods, given in the following table, I have based my calculations upon what I consider the average composition of several articles, when of good quality.

TABLE,

Showing the estimated value of the Manure obtained from the consumption of 1 ton of different articles of Food; each supposed to be of good quality of its kind.

	Description of Food.	Estimated money value of the Manure from 1 ton of each Food.
1.	Decorticated Cotton-seed Cake	£6 10 0
2.	Rape Cake	4 18 0
3.	Linseed Cake	4 12 0
4.	Malt-dust	4 5 0
5.	Lentils	3 17 0
6.	Linseed	3 13 0
7.	Tares	3 13 6
8.	Beans	3 13 6
9.	Peas	3 2 6
10.	Locust Beans	1 2 6 (?)
11.	Oats	1 14 6
12.	Wheat	1 13 0
13.	Indian Corn	1 11 6
14.	Malt	1 11 6
15.	Barley	1 9 6
16.	Clover Hay	2 5 0
17.	Meadow Hay	1 10 0
18.	Oat Straw	0 13 6
19.	Wheat Straw	0 12 6
20.	Barley Straw	0 10 6
21.	Potatoes	0 7 0
22.	Mangolds	0 5 0
23.	Swedish Turnips	0 4 3
24.	Common Turnips	0 4 0
25.	Carrots..	0 4 0

It will be seen how enormously the value of the manure from one ton of different foods varies according to the composition of the food itself. Now, from the actual analyses that have been made of several of the expensive "condimental" compound foods, as well as from a knowledge of the chief articles used in their manufacture, it may be safely asserted that a ton of few, if any of them, would yield a manure of anything like the value of either of the first nine articles in the above list. In the case of the majority of these new foods, the value of the manure from a ton of the food would certainly be much less than that from a ton of any one of those nine articles.

To conclude: No experimental evidence upon indubitably trustworthy authority has yet been brought forward to prove that the use of the foods, costing from £40 to £50 per ton, will so improve the rate of increase of fattening stock upon a given weight of dry substance of food, as to compensate for the heavy cost of these condimental additions. Any intelligent farmer can, however, by the aid of the information which has been given above, satisfy himself on the point, if he will rigidly rely upon scales and weights, instead of upon merely casual observation. And with regard to the value of the manure, the figures in the above table, and the observations we have made upon them, will show him how much of his £40 or £50 he may expect to recover in the form of manure.

J. B. LAWES.

Rothamsted, Jan. 18th.

KINGSCOTE AGRICULTURAL ASSOCIATION.

The January meeting of this association was held on the 3rd. In consequence of the very unpropitious state of the weather, the attendance was not so numerous as usual. This was to be regretted, the subject for consideration being of great importance, viz., "The best means of establishing confidence and imparting a mutual understanding between agriculturists and their labourers." It was introduced in a very able manner by Mr. F. Burnett, as follows:—

Mr. BURNETT said: Mr. Chairman and Gentlemen, it must be admitted that this subject is one of the greatest interest and importance, as the condition of the whole community depends upon its several parts. It is therefore impossible that too much attention can be given to it by any class, but more especially by those with whom the labourer is brought into daily contact. I doubt not much has been done and is doing to promote that kind feeling and mutual understanding which most essentially ought to exist between the agriculturist and his labourers, but I am sorry to say I cannot see that marked improvement which we often hear of, and which is much to be desired. The indifferent and unkindly feeling existing in many instances, goes a great way to prove that some very important point is deficient, if it does not prove that the whole system is bad. If the connection between the employer and the employed is to be improved, we must bear in mind that every position has its influence, every means its effect, and every way an end. If the labourer is to live a contented and moral life, it is necessary that he should have the example of it in his superior. If he is to be comfortable, he must have an opportunity of being so, and it will be in vain to persuade him to change his ways, unless it be proved to him that the change will be for his present and future advantage. Much may be done to obtain the service of his heart as well as of the hands; but it must be borne in mind that all must be done in a friendly spirit, emanating solely from a desire for the benefit of the labourer, otherwise he will imagine his employer influenced by selfish views, instead of seeking his advantage alone; while should he see him anxious to promote his interest, and find his comforts increased under his direction, it will insure his confidence, which is the first step towards imparting a good and mutual understanding between the agriculturists and the labourer. Master as well as man need to keep in mind the true principles of religion, with respect to their duty towards God and towards their neighbour. If this were strictly attended to, I am satisfied the relation of both would be satisfactory, while without this it can never be. The worldly relations and interests of the two are directly opposed to each other, the labourer naturally requiring the largest possible remuneration for his service, and the employer as naturally wishing to get his work done for the smallest amount of pay. "Do unto others as you would be done by"—"Bear and forbear," are the great maxims by which our actions should be regulated in our dealings with one another; and when these great principles of truth actuate all our conduct, the path of life, which otherwise would be a rugged one, becomes comparatively smooth; and whatever may be our station, or share of this world's prosperity, that may fall to us, this great principle must be our rule, if it is our desire to establish confidence, and promote a good understanding amongst those with whom we are in constant and daily intercourse, whether as masters or servants. Keeping this in mind, as we are naturally bound to do, if we have any hopes of success, we will now proceed to discuss how the relations of masters and servants may be improved socially; and first, as to the master. It is unfortunately too much the practice of masters to consider they have fulfilled all duties when payment has been made for work done; and on the other hand for the men to consider their duties are fulfilled when the day's work is done; but they forget that there are claims from each of them, of the duties of neighbours, and the claims for mutual sympathy to the best of their respective abilities. Masters are indirectly in a great measure responsible for the conduct and behaviour of those placed under them (in servitude). It may not be necessary for the master to take upon himself the duties of the clergyman or the schoolmaster; but if he has the ability or the inclination, how wide a field of usefulness is there open for him, in devoting some portion of his time in giving instructions to the young people whom he employs, and who are in such need of this instruction.—Mr. Burnett went on to say that it was the duty of the master to set a good example to his labourers in respect to morality, and especially with regard to the observance of the Sabbath. He then alluded to the habitations of the labourers, which he said were, in many cases not in unison with the accommodation provided for the inferior animals, and incapable of affording the means of keeping up the common decencies of life. What was also to be regretted, too, was the distance the labourer had often to walk to and from his home. This brings us (continued Mr. Burnett) to the point where the third person has a duty to perform; although for the condition and comfort of the labourer, and the interest of the employer, it must be the duty of the landlord to provide suitable accommodation for the labourer, conveniently situated for the cultivation of the farm, and also to his interest, as each requires that the land should be so cultivated as to yield the largest amount of produce at the least amount of cost. This, I am pleased to say, many of the landlords in this neighbourhood have fully entered into, not merely for their own interest, but to promote the feeling which they are desirous to see exist between all classes. I will not go into detail as regards the style and expense of building labourers' cottages, as it is not directly bearing on the subject for discussion, but will briefly state what a labourer requires for the accommodation of his family. It is a habitation sufficiently roomy and substantial, furnished with appliances to answer his and their daily wants, with not less than three bedrooms, and four are desirable, if there is not sufficient room in the farmhouse for the young men and lads you may require, one room as eating and sitting room, and a wash-house with fireplace, boilers, and oven. All with a sufficiency of light and ventilation; a window to open in each room, as the health of the inmates depends much on well-aired rooms, also upon the proper drainage of the premises. A garden of not less than a quarter of an acre should certainly adjoin the cottage. A garden to a labourer's family is of the greatest importance. It affords many comforts which they otherwise would not possess, and is a great source of pleasure and interest to parents and children, where they can plan and work together and see the fruits of their labour, and where the children can learn to dig, hoe, and weed, under the eye of the mother. This is far preferable to the allotment system; indeed, an allotment is not required when a man has a garden of that size, for it is quite sufficient for him to work without interfering with his employer's time, and whatever serves to divert him from a reliance upon his daily wages as a means of support must tend to derange the relation between him and his employer, and will eventually prove injurious to both.—Mr. Burnett then went on to say that it was important that all the labourers employed on a farm should be engaged for a whole year, and referred with satisfaction to the recently-established register offices, as far preferable to the old-fashioned hiring fairs and mops. He then considered the question of payment in kind, and quoted the opinion of Mr. John Grey, of Dilston, who contrasted North Country customs (where payment in kind prevailed) with those of the South, to the advantage of the former. His (Mr. Burnett's) own opinion, however, was in favour of a money payment. Then as to the amount of wages, this must be regulated by the laws of supply and demand, and any interference between master and man would be productive of injurious consequences. It has been well observed by Mr. J. C. Morton (continued Mr. Burnett), that good masters should treat their servants not according to their need, but according to their merits. Let us pay men according to their need, and we shall soon have them needy enough; but pay honour to skill, and ability, and trustworthiness, and labourers will strive after them. Let the best labourer have the best wages, whether he have a family or not, whether he have any other means of support or not. It is greatly to be desired that our young men should understand that it is upon their own exertions they must depend for rising, or even for maintaining their position, and this they will best find out by seeing that it is not the helpless who share our strongest sympathy, but those who are getting on in the world. Payment by the piece where practicable will tend very much to promote good understanding between master and man, because it recognizes the ability of the labourer, the skilful and industrious man being duly and fairly rewarded for his skill and exertions. In letting work by the piece to the regular staff of labourers on the farm, or part of that staff, each should be responsible for the work done, and each have his full share of the payment. If let to one, he, of course, makes the best bargain with the employer, and pays as little as he can to those who assist him in performing the work. They are also excluded from intercourse with their superiors, and are placed under the control of a middle-man, which cannot in any way promote confidence and mutual understanding. In conclusion, Mr. Burnett referred to the custom of giving beer (to the amount of 1s. per week) in this neighbourhood as part wages, and strongly condemned the practice, as being in every respect injurious. The objection that labourers could not be obtained without it was unfounded. Practical experience (he said) has led me to this decision, that the labourer ought to have his wages in money, that he may have the opportunity of spending it on those necessaries of life he has most need of; and as I belong to that class whose lot it is to earn their bread by the sweat of their brow, I think my opinion is something more than mere theory; and were I to commence life again, and placed in the same position as I was when I left my father's home, without any dependence or means of support but the labour of my hands, I would not think of asking my employer for beer—nay, I would not barter my services for it, feeling sure that it would not tend to my advantage, nor to impart a good and mutual understanding between the employer and the employed.

Mr. DREW said: I quite agree with Mr. Burnett that the subject which he has just laid before us is of great importance, and highly deserving our consideration. That there is a want of confidence and a better understanding as regards the relationship existing between agriculturists and their labourers, I am fully convinced, for go where you will, or speak to whomsoever you may, on the subject, you are almost certain to hear complaints of some kind, "that labourers have the last few years retrograded rather than progressed." I am fully persuaded of this, both in the amount of work they do, and the skill and interest shown in performing it; for, on looking back to the time when I first went among my father's labourers, how anxious all seemed not to be behind with their neighbours, and that their work should be done in a creditable manner! As soon as the harvest was commenced, with what spirit they set about it! Each farmer's labourers vieing with the others, as to who should finish first; on accomplishing which, how hearty and loud was the harvest-home "hallow!" The last few years we have seen or heard little of this spirit of emulation. What the cause is, or on which side it lies, is not so easy to determine, or else a remedy might with greater certainty be suggested. A very general cry is the want of education. Now, I do not think this can be the only true cause, for we all know educating the labouring class has been for some time past carried to a much greater extent than was the case twenty-five or thirty years ago. Now let me not be misunderstood. I do not for a moment wish to say one word against education suitable to their condition in life. On the contrary, I do wish every one were taught to read and write, and also the first four rules of arithmetic, simple and compound; but by all means let the bible be the great and grand monitor, by which to instruct them. I contend that if a child is taught to read and write, with a little of arithmetic, if he possess gifted or superior ability, he will not rest satisfied, but will use every means to further his improvement. Others recommend our giving a higher rate of wages. Now wages have risen considerably since my recollection, whilst almost all necessaries of life are reduced in price. Still it has not in the least degree promoted that unity and kind feeling which we are anxious to see exist. Hiring fairs (or mops as termed in this neighbourhood) come in for a large share of condemnation. They are said to create immorality, revelry, and drunkenness to a great extent. It must be remembered that they have existed for a long period, and I do believe the evils said to take place on these occasions are much exaggerated, and they are not so great now as formerly. We also hear complaints of a like nature, in places where they are not held. I do not say there is not room for improvement, neither do I see why with perseverance it might not be effected. A system of some kind is in my opinion necessary. The question is how to devise a better. Our friend Mr. Burnett has mentioned register offices. If we could establish an office in every parish, and employers would make it a rule as soon as a labourer left him to send his character, I think it might be managed; still I am of opinion that, for the purpose of hiring, a certain time and place should be fixed, being a saving of time and confusion. As regards sufficient cottage accommodation, I readily and heartily fall in, for I do believe nothing would be more conducive to the well-being and comfort of the labourer, than that he should have a convenient and comfortable home. A great drawback to them, in my opinion, has been the Law of Settlement. From false alarm, and fear of having a ruinous increase of poor-rates, cottages have been pulled down, driving the labourers to the necessity of seeking a home in towns and other places, at a distance from their work. My own occupation is badly situated as regards accommodation in this way. I find from enquiring that my labourers (averaging them) with the exception of those occupying the cottages on the farm, walk two-and-a-half miles to and from their work, or five miles a day. This, calculating 300 working days in the year, amounts to 1,500 miles in the year; reckoning thirty miles as a fair day's work (and I think few of us would like to do more), makes their time of labour fourteen months in the year instead of twelve. I have a man now working for me, who left Mr. Thomas a short time since. He told me he worked for him seven years, the distance to and from he had to walk daily being seven-and-a-half miles. Now, this man in the seven years walked 15,750 miles, or within a trifle of two-thirds the circumference of the globe. These facts and figures ought strongly to impress upon us the importance of a good supply of labourers immediately on the farm. The question then is, how are we to bring about that confidence and good understanding which should exist between agriculturists and their labourers? I think Mr. Burnett has in some measure shown us; for I am of his opinion, that good and sufficient cottage accommodation is one of the greatest means. It would give us a better opportunity of entertaining their wants and grievances, and of ameliorating their condition by little acts of kindness. We should also have them a little more under our control.

The CHAIRMAN believed Mr. Thomas had a few years ago tried the system of paying his labourers wholly in money, instead of part in beer; but had since returned to the old mode. Perhaps he would state his reasons for doing so.

Mr. THOMAS said, he was of the same opinion on the question of beer as he had been for some time past. He believed money payment best for the labourer, and most satisfactory to the employer. At the time alluded to by Mr. Holborrow, he mentioned the matter to several of his neighbours, who fell in with his views; but, however, did not back him in trying to amend the abuse. The consequence was, a good deal of grumbling and dissatisfaction among his men. It was under these circumstances he thought it right to return to the old system of allowing beer. If all would unite, the change might be effected, but it is not so easy for one individual to alter a custom of so long standing. He concurred with the remarks that had fallen from Mr. Burnett. That gentleman had entered so fully into the subject, that little remained to be said. He trusted his suggestions would be acted on and he felt greatly obliged to him for the very able manner in which he had brought it before them.

Colonel KINGSCOTE thought there would be no difficulty in doing away with the beer, if farmers were only determined in the matter. His own labourers had now been working eleven years without it, and he believed were more contented, and that the money was of greater service to those having families.

Messrs. Kilmister, Barber, Ford, with other members, took part in the discussion. Their sentiments and expressions in a great measure coincided with the statements before made.

The following resolution was then passed :—

" Resolved—That the best means of establishing confidence, and imparting a mutual understanding between agriculturists and their labourers, is to provide sufficient cottage accommodation, conveniently situate for the regular staff of labourers required on the farm ; that it is the duty of every employer to ameliorate the condition of his labourers as far as he can, by acts of kindness and attention to their wants and necessities, and to point out to them by precept and example the benefits and comfort that would accrue from leading a moral, civil, and contented life ; that labourers should be fairly remunerated for their toils according to merit, and not one uniform rate ; and that their wages should be paid wholly in money, instead of part in beer or cider."

Mr. Blackwell proposed a vote of thanks to Mr. Burnett for his able and important paper, which was heartily accorded to him by all present. Thus the proceedings terminated.

LONDON, OR CENTRAL FARMERS' CLUB.

A meeting of the Committee was held at the Club House, New Bridge-street, Blackfriars, on Monday, January 2nd—L. A. Coussmaker, Esq., of Westwood, the Chairman for the year, presiding. There were also present Messrs. R. Bond, C. J. Brickwell, W. Cheffins, G. Cobb, T. Congreve, J. Cressingham, W. Fisher Hobbs, James Howard, J. G. King, E. Little, E. Purser, B. P. Shearer, J. B. Spearing, James Thomas and H. Trethewy.

The minutes of the December Committee Meeting and of the General Annual Meeting were read, and the usual monthly statement of the Club accounts received.

The following Members were elected—

R. Scott Burn, Stockport.
S. Clapham, Stackhouse Settle.
E. Edmonds, Rugby.
E. K. Fisher, Market Harborough.
G. Martin, Hubert's Bridge, Boston.
H. E. Murrell, Wallbrook.
J. Pickering, Trethlingboro' Grange, Wellingborough.
J. W. Robinson, Wyberton, Boston.
J. Thornbury, Washingborough, Lincoln.

Some other names were read for the first time.

The following subjects were selected for discussion at the monthly meetings during the ensuing year—

February 6.—" The Sewerage of Towns, as it affects British Agriculture" ; proposed by Mr. Alderman Mechi, Tiptree Hall, Kelvedon.

March 5.—" The Over-Preservation of Game" ; by Mr. H. Corbet, New Bridge-street, Blackfriars.

April 2.—" The Merits of Pure-bred and Cross-bred Sheep" ; by Mr. C. Howard, Biddenham, Bedford.

May 7.—" Wheat Growing on the Lois-Weedon System" ; by Mr. J. Algernon Clarke, Long Sutton, Wisbeach.

June 4.—" To what extent is the Farmer benefited by the substitution of Steam Power for Horse and Manual Labour?" by Mr. J. Wells, Booth Ferry House, Howden.

November 5.—" The Public and Private Trials of Agricultural Implements—Can they be made more Efficient ?" by Mr. W. Fisher Hobbs, Boxted Lodge, Colchester.

December 10.—The Condition of the Labourer in England and Scotland, and his state on the Continent" ; by Mr. R. Scott Burn, Stockport, Cheshire.

A letter was read from Mr. Brandreth Gibbs, the secretary of the Smithfield Club, suggesting that, as the Smithfield Club dinner in the show week had been brought forward to the Tuesday, that of the Central Farmers' Club should now be held on the Monday ; upon which the following resolution was passed, the Secretary being requested to communicate it to Mr. Gibbs—

" The Committee of this Club much regret that the Smithfield Club should have fixed its dinner for the same day as that on which the Central Farmers' Club has for many years held its annual dinner ; and the Committee trust that the Smithfield Club will reconsider the subject.

" As the Farmers' Club has invariably a discussion on the Monday evening of the Cattle Show, no other day during that week is so suitable for its annual dinner as the Tuesday ; and the Committee consequently determine to hold the dinner on that day as heretofore."

A letter was received from the Rev. Andrew D. Stackpoole, the vicar of Writtle, Essex, announcing the death of Mr. Robert Baker, of Writtle, and upon which the following resolution was passed—

" The Committee of the Central Farmers' Club desire to express the deep regret with which they have heard of the death of their excellent friend and member, Mr. Robert Baker, of Writtle. They feel that, by his decease, the Club has lost one of its most valuable members, and they beg sincerely to condole with Mrs. Baker and her family under their severe bereavement. The Committee feel assured that their sentiments will be shared, not only by the other members of the Club, but equally so by the whole of the agricultural community."

A recommendation from the last General Annual Meeting that the salary of the Secretary be increased, was unanimously adopted.

WILL THE EWE BREED TWICE IN THE YEAR?

In these stirring days of agricultural progression one may be forgiven for travelling a little out of one's way to acquire information, even upon subjects which appear to all the agricultural world as having had their quietus long, long ago. I am, however, an old practical farmer, and have lived to see so many and such great and important changes in my business as a farmer, that I see no bounds to our advancement. Matters that were most assuredly derided one or two generations back, are quite the prevailing fashion now. " Nothing equal to true-bred animals," said our fathers. " Nothing equals the improved half-breds," say our sons ! " Never bring up the hungry clay," said our fathers. " Deep cultivation is the salvation of clay lands," say our sons ! Who is to judge when we arrive at, and what is, " the acme of perfection " ?

Well, experience and scientific research are now our teachers ; I want the result of both, upon the simple question proposed above. Will the ewe breed twice in the year ? I believe she will, and I beg that some of my readers will kindly give, through the columns of the *Farmer's Magazine*, their experience or record of any cases or facts of this double bearing in any part of their flocks, or that may have come under their notice ; and also how the animals were treated, and with what result ? It is certainly a subject of no little importance ; and in these days, when fat lamb is in such extraordinary demand, I again say I may be forgiven for making such a singular enquiry. It cannot have escaped the notice of the most casual observer of our different breeds of sheep, with what rapidity some will fatten their lambs, how others will fatten themselves ; what prolific breeders are some, what excellent sucklers are others ; and, then, look at the extended range of cross-breeds, who knows to what good account these may be turned ? I see no impossibility in the way.

No one would be more gratified than myself to find that some of our breeds could be made to fatten two crops of lambs in one year. The average gestation of a ewe is about one hundred and fifty days, consequently there would be about sixty-five clear days for the early sucklings. But as she would generally take the ram in about three weeks after lambing, she would require the best and most nutritious keeping to enable her to fat her lamb and keep herself in condition. I am quite sure that nothing of this kind need be attempted except under high keeping, and the most careful and constant attention; but with these in full exercise I fully believe the system is a practicable one, and could also be profitable. The following extracts being to the point, I would rather give them than add more of my own ideas upon it:

"The ewe will breed twice in the year, if it be made a point to produce such an effect by attention and high keep; she will receive the male indifferently at any season, and, like the rabbit, very soon after bringing forth. Lisle gives an instance of three of his ewes, well kept, lambing at Christmas, fattening off their lambs at Lady-day, and producing lambs again the first week in June... Could the lambs be advantageously weaned at two months, sufficient time would, he conceives, remain for the ewe to bring forth twice within the year. For example, suppose the young ewe tupped in August, the lamb would be dropped in the middle of January, and might be weaned in mid-March, the ewe again receiving the ram on the turn of the milk, like the sow, perhaps in or before April, she would then bring forth within twelve months or in August. This plan would, continues Lisle, injure the dam infinitely less than suckling during gestation."—*Loudon's Encylopædia.*

The practice of obtaining lambs twice from their ewes in the year was the almost invariable custom throughout Flanders some years ago. "The custom of breeding twice in the year was never generally adopted in great Britain. It occasionally happened, but mostly unsought for, among the Dorset sheep; and by some farmers it used to be followed on the Mendip Hills." "There is an instance on record of the power of thus producing two families in the year not being confined to the Mindip and Dorset breeds." "In the spring of 1801, Mr. Sheriff, of Kinmyles, Inverness, bought a parcel of ewes in lamb, of the white-faced Highland breed. They lambed in March and April. The old ewe, without a tooth, dropped a second lamb on the 1st of November, 1801; a third on the 29th of April, 1802; and a fourth on the 12th of January, 1803; so that she brought forth four lambs at different times in the course of twenty-one months."—*Agricultural Magazine*, Feb., 1803.

These facts are decisive as to its practicability. I offer no remarks or inducements to influence breeders: my object is to promote inquiry and gather information, for sure I am that the present practice of slaughtering the lamb and the dam in the same year will ere long bring a crisis in the sheep market. Something must be done to uphold and increase the breed of sheep; and if any of my readers will be kind enough to furnish facts and data of any useful application of this system as suggested, I shall be most happy again to take up the subject, and old-fashioned and obsolete though it be, try and make the best of it, with the hope of ultimately providing a better supply of that much coveted dainty, "fat lamb," without so fatally detracting or destroying our breeds of sheep. P. F.

CAN OUR SOILS BE MADE TO PRODUCE TWO CROPS IN ONE YEAR?

I take the liberty to ask the question proposed above, with the view of ascertaining what double crops the land can be made to produce; and I trust some of my intelligent readers will be kind enough to give their experience in the columns of this magazine. This is one way—and I think an excellent one, too—of promoting agricultural progress.

I will endeavour to explain my views in seeking this information. We have now arrived at a point in agricultural progression which has almost placed us beyond the vicissitudes of seasons, or the poverty of soils. Subsoil-drainage and steam-cultivation have done very much to obviate the difficulties arising from our singularly fickle climate; and our artificial manures, scientific rotations, and excellent management, have overcome the poverty of our soils. We are, then, comparatively independent. No sooner is one crop removed or eaten off, than we are ready for another. The gigantic power of steam, with its ploughs or its cultivators, is at once at its work; the soil is soon prepared, and a succeeding crop is immediately provided for. There can be no hesitation in adopting a course like this; it is infinitely better than to permit the soil to lie idle for months. By breaking it up and extending the cultivation, it becomes enriched by atmospheric and ammoniacal influences, alike imbibed both from the air and the subsoil. It is thus, under cleanly management and good drainage, that soils may be prepared to receive *two crops in one year.*

We will now inquire what these crops are to be. Not corn crops, of course. Our climate, although greatly improved by drainage and cultivation, is too cold to produce two corn crops of any variety in one year; and, even if it could, I am not sure they would be so profitable as the course we may and can adopt, and which, under existing circumstances, appears to be most desirable. I mean this: the production of animal food for the multitude has for the past few years become more profitable than the production of grain. The latter is of ready importation: the former is far otherwise, particularly in a fresh state; consequently if by any process in management we can produce more green food and root or vegetable crops for our domestic animals the better, and of these it is possible to produce *two crops in one year.* Mr. Pusey, in his Essay on the Progress of Agricultural Knowledge, published in the Royal Agricultural Society's Journal, 1850, says: "These matters are so well known to good farmers, that I am almost ashamed of describing them: still, I wish them to be not only common, but universal; that is, on all the lands suited to them." The "matter" or course recommended is this: As soon as the wheat crop is off, the land is to be immediately prepared for rye on one field, which is first sown, and for tares on another. The rye "comes soonest to feed"; "the land ploughs up after rye in a friable state," and the crop is eaten off in time to sow the land with swedes. The tares succeed the rye for feeding, and are eaten off in time to sow with common turnips. This is a frequent course in many districts, and under steam-cultivation will undoubtedly be widely extended. In other cases early peas, to be followed by turnips, are by no means uncommon. In others, early cabbages, early potatoes, and the like, are eaten or removed, and turnips or coleseed follow; but it is not my intention at this time to offer suggestions, but to request information. My next question will be, Can our soils be made to grow two crops at one time? My object is to excite inquiry, and elicit facts out of the ordinary path, with the hope that some good may arise out of it. P. F.

THE HERDS OF GREAT BRITAIN.

Chapter XIV.

THE FARNLEY HERD.

A peep at Duchess 77th, who had "gone on" so marvellously in the nine weeks since Warwick, that we hardly knew her again, succeeded by a long attempt to unravel the genealogy of a very compact little cow on the road side, whose tail had been half bitten off by a dog, and whose venerable mistress, as she fed her with cabbage, dwelt on the fact she was "a good butter thing," and that we were "not the first, by mony a dozen, who'se stopped to ask where I gat her," are the principal Shorthorn links in our mind, between Brandsby and Farnley. We must not, however, forget the grand fat beast which grazed up to its knees in a pasture, and the still grander scorn of its owner, when we asked him, on the bridge, whether he was going to have a try with it at the York Fat Show, and learnt for our pains, that "we can grow and eat our own Christmas beef in Masham."

Our old foe, the drizzle and mist, was there before us, when we alighted at Arthington station; and even the Wharfe, so beloved by tourists and photographers, which we have so often longed to trace with them from its source in the bleak moorlands, past Bolton Abbey, so majestic in its calm decay, the water-healing Ben Rhydding, and on through thick woods and broad meadows, to Wetherby, quite lost its charm for us in that chill September morning. Our note-book was dropped back moodily into our pocket, without one scenery remark the entire three miles, and we felt that there would be nothing for it, but to coincide with the observations of a Yorkshire Directory, penned in a vein of descriptive eloquence, hardly natural to man: "The Vale of the Wharfe is adorned with elegant mansions, and the views obtained from neighbouring elevations are at once noble and commanding."

And so old Coates must have thought from his heart, as laden with weighty calf-records, and still weightier bull data, beginning from Abelard, that descendant of "Booth's lame" and "Booth's old white" bulls, he gained the top of the wooded ridge of Sheven, and patting his white mare's neck, descended on his winding road to the homestead at Greenholme, which lay stretched, westward of the little market town of Otley, like a land of Shorthorn promise beneath. It was here that "The Improved Durham Breed" found a home in those dreary hopeless times which followed upon the Comet mania and the war, when 30 guineas a season was a great bull hire, and 80 gs. a marvellous purchase; and the Americans might well say, as the heavy yellow post chaise, or the twice-a-week coach from Leeds bore them back again south, that there was plenty of truth in the report, which had got wafted across the Atlantic, that "There were now not twenty such cows as Mr. Whitaker's anywhere."

Like Lord Althorp, the Rev. H. Berry, Mr. Wiley, Mr. W. F. Paley, and a few others, Mr. Whitaker never bated one jot of heart or hope, and "the quiet afternoons at Greenholme" have borne their rich fruit to short horn breeders at last. Without his earnest aid, Coates would never have ventured to bring out the first volume of the Herd Book in 1822, when nothing but "Corn and Currency" was on every English tongue, and agrarian outrage and hunger were raging across the channel. It was "printed by W. Walker, at the Wharfdale Stanhope Press, top of the market-place, Otley;" and a manuscript copy of it is still preserved, written out in Mr. Whitaker's own neat hand, and with his red ink annotations, which now almost need a microscope to decipher. It would seem as if he had walked about for years with the images of every great cow or bull firmly fixed in his retina. Of Duchess First he merely says "fair;" of Duchess Second, "droops;" while Hubback comes in among other criticisms for "*flank and twist wonderful*; *shoulders rather upright.*" Three-fourths of the original list of subscribers have gone to their rest; and so too, within the last month has the patriarchal James Ward, R.A., who condescended to draw Maria and Miranda on the stone for the work, and speculated on the coming fortunes of a certain young self-taught mail driver, Herring of Doncaster, who had also borne a hand and sketched the heifer "Daffodil in two positions." A few years later, the present editor of the Herd Book, then a mere lad of fifteen, fresh from his school studies of the Durham ox and Coates's Driffield cow, was sent over to paint Charles (878) for the second volume, and like Culshaw, whose boyish embassy to the same spot we have already narrated, he dates his chief short horn impressions from that weary journey, two-thirds on foot, and a third in the carrier's cart. Tim Metcalfe the herdsman was also a remarkable character in the Greenholme drama. He "*knew 'em when he saw 'em*" as well as any man, but as he never knew his alphabet, he invariably clenched the matter with, "*Give me t'pedigree, and I'll tak it home t'it maister.*" No wonder then that the taste for Short-horns should have gradually spread along the Wharfe, and not only brought new tenants to browse in the pastures of Farnley, Broughton, and Denton Park, but tempted the Duchess tribe to renew their strength, in later years, near Wetherby.

Mr. Fawkes's career as a breeder of Shorthorns may be said to have begun in earnest with Mr. Whitaker's stock; but still he had tried his 'prentice hand at both Bates and Booth before, and never bought or hired from either of them again. His first purchase was Norfolk (2377), a grand roan bull by Second Hubback, and *then* such a favourite of Mr. Bates's, that he sent four heifers from Kirklevington expressly to be served by him. One of them was "*my best Duchess*" 33rd, the great grand-dam of Grand Duke; another, Blanche by Belvedere, from whom Roan Duchess 2nd is in direct descent; and a third founded the Waterloo's of Aylesby and Springfield fame. Norfolk himself was from Nonpareil by Magnet, rather a gaudy cow, from Mr. Barker, of East Layton's sale, where Sir Charles Knightley purchased the Rose and Primrose, which, along with Rufus and Little John of Mr. Arbuthnot's breeding, virtually founded the Fawsley herd. In 1834, Mr. Fawkes bought Verbena and the magnificent Medora, for 39 gs. and 35 gs., at Mr. Richard Booth's Studley sale, and bred nine calves from the latter. The year previous Mr. Whitaker sold off his herd, and again bought about three dozen well-bred cows, for the use of his workpeople, at the Burley mills. Mr. Fawkes was so much struck with the looks of some of them, that he arranged with his neighbour to allow him to select twenty for service principally by Norfolk. The compact was to be in force for three years, and ten guineas was to be paid for each of them, doublets or not, at the expiration of a week, provided it was not a blacknose, and had no symptoms of unsoundness. Hence sixty were transferred during that period from Greenholme to Farnley, and the first ten bull calves by Norfolk averaged 100 gs. each. The very first bull-calf that was dropped, received the title of Sir Thomas Fairfax (who won at the Bristol Royal, and twice at the Yorkshire Society); and the Ohio Company offered 400 gs. for Norfolk in vain on that trip, when, but for Mr. Whitaker's faint praise, they would have carried off Duchess 34th in calf with the Duke of Northumberland. However, they took away the Duke of York (1941) for 150 gs., who had been sold as a calf for fourteen guineas, at Mr. Whitaker's sale the year before, and bought some lots at the Studley sale as well. When he was rising four, 250 gs. was accepted for Sir Thomas Fairfax, and he departed to Brawith, leaving eight-and-twenty Fair-named calves behind. Only old Fairy Tale remains to testify to this beautiful favourite, but she has bravely supported his line with fourteen calves since 1842. Medora had been helping meanwhile to carry on the Norfolks, thrice from the old bull direct, and thrice from Sir Thomas Fairfax, and when the three years' lease of Mr. Whitaker's cows had expired, the Farnley herd mainly consisted of some thirty two-year-old heifers.

Laudable (9282) by Liverpool (4235) was purchased for 200 gs. at the Newcastle Royal in 1846; but he broke his stifle after a few years' service, and then came Bridegroom (11203) from Mr. Lawson's of Stapleton Grange, Darlington. From this bull, who was by Lord Ducie's Lansdowne, a son of Cramer (the Royal Shrewsbury prize bull), Mr. Fawkes laid the foundation of a regular succession of Royal winners. Lydia Languish was by Lord Marquis, from a heifer bred by the Duke of Buccleuch at Boughton, and Sir Edmund Lyons (15284), who won the head yearling bull prize at the Salisbury Royal, the Yorkshire, and Stockton shows, was the result of her cross with Bridegroom. Sir Edmund Lyons's career was very short, as he had to be slaughtered, in consequence of a rupture. Bridegroom's Royal glories did not, however, rest here, as John O'Groat was by him, from Julietta, bought at Mr. Ambler's sale in 1852; and so was General Bosquet (14,591), a winner at Chelmsford Royal, the Yorkshire, and the Northumberland shows, from Betty Foy, a great grand-daughter of Fairy Tale. Sir Edmund Lyons was generally considered by breeders to be a neater bull than the massive and mossy-haired General Bosquet; but still John O'Groat was perhaps the finest and most stylish bull that Mr. Fawkes has yet bred. Reducing General Bosquet, when the show season was over, proved fatal to him, and his son Bon Garçon (15669) (from Lady Griselda by Laudable), the winner in the bull-calf class at Chester Royal, died at fifteen months, from the quarter-evil, after four and a-half hours' illness, and only left two calves. He would have met Royal Butterfly at Northallerton, but he was just too old to go into the class. Lord Marquis (10459) by Laudable proved a very profitable sire. After being placed second to Mr. Chrisp's Phœnix at Lewes, he won the prize at the Yorkshire show, and his son Robinson Crusoe from Lovely is at present the senior bull of the herd. Still amid the old heroes of Farnley and Greenholme, we must not forget the neat and good Milton (7238), nor his sire Rockingham (2550), who owned no master but a certain dog, after his ring had been torn out of his nose.

It has been Mr. Fawkes's habit to have periodical bull sales, which have at times reached an £80 average. Roans have been his favourite colour; and it is the result of his experience, that a white bull upon a red cow is much more certain to produce them, than a red upon a white. As a general thing, he does not sell his females, and this year he has bred about twenty-six calves from twenty-five cows. The Emperor of the French's agent transplanted three roan heifer-calves by Bridegroom, along with Maid of Lorn, from this herd to the Imperial stalls; and Kentucky and Ohio have not left it unransacked in their searches after blood.

The house itself, which was originally built in the time of Elizabeth, was added on to, about a hundred years ago, and stands on a rising ground, a mile and a-half to the north-east of Otley. The road winds up through the well-wooded park, of a hundred and forty acres, and so along an avenue thickly lined with laurels, among which "the merry brown hares come leaping," and the pheasants feed in troops, as if the crack of a Manton was a sound unknown in Wharfdale. A road to the right, just before we reach the quaint old iron gates, leads across a bridge, and past the aviary to the farm-yard buildings, part of which once composed the ancient kennels, from which Mr. Fawkes in his younger days was wont to ride forth at the head of his harriers. All the cattle stand on wood spars in old-fashioned comfortable boxes; and a neat red heifer calf, Villa Franca, by Sultan (17053), from Fatima, and the infant of the herd, was our first introduction. Then came Lady Lyons by Sir Edmund Lyons, from a Laudable cow, a lighter roan than her sire, with a nice coat, and plenty of length, but perhaps a trifle flattish. Amphitrite, another of Sir Edmund's get, from Ada, stood near her, with a remarkably neat head and forequarter, but the bull was still more favourably transmitted to her posterity by Solferino from Clairvoyant, a very fine calf indeed, with great thickness, and fine handling. Magenta, by Don Giovanni (a son of Robinson Crusoe, who was first as a yearling at Durham, and was sold to Mr. Bostock for Australia), came next, in the shape of a very level rich-coated calf, with that fore-quarter on which Mr. Fawkes has always laid so much stress, and gives us good reason to regret that there are only two calves by this bull in the herd. The dark-red Cannonball was another of the Robinson Crusoes from Cannonade, a Bridegroom cow, with a great deal of character, and delightfully neat in the offal.

Montebello by Bon Garçon, from Juliana, was the occupant of the first of the long platoon of bull boxes, in the same yard, and came out in the shape of a very thick roan, with capital hair, and good back and loin. The white Gardoni, a brother to Don Giovanni, and son of Grisi, one of the best breeders in the herd, had also a wonderful back and loins, and looks quite a prize bull; though, perhaps, we were more struck with Election from Lady Fanchette, and Reformer, the fourteenth in the Fairy Tale calendar; both of them by Sir Edmund

Lyons. The former would remind us slightly, both in size and style, of John O'Groat; but the red had a rare fore-hand and rich coat, and although he was not quite so evenly built a calf at that time, we believe that judges now prefer him. The appropriately named massive Grampus was another of the same blood, and strained back through Mrs. Gamp to Medora, but he was plain, and his length was a little trying; and Agamemnon was amiss and not shown.

Sultan and his sire Robinson Crusoe were the sole tenants of the Bull Paddock. The former is an animal of remarkably good quality, and deep in the fore-quarter, like his sire, while the latter, who was six years old last April, is perhaps on the shortest leg we ever saw, and hence his bosom seems almost to sweep the ground. His carcase is immense, but he is not quite so handsome in his hind-quarters as in his fore, which are not quite so neat as Sultan's; and take him altogether, he is one of those remarkable-looking bulls, of whom we have seen portraits in plenty, but in whose fleshly existence we have never quite believed. Royal Oak, a purchase at Mr. Wetherell's sale, was in another paddock hard-by. He had not been much forced, and in spite of his good quality he seemed rather to lack that style, which we might have expected to cross nicely with those great fine old-fashioned cows that have always been such a leading feature in the Farnley Herd. Lawnsleeves by Bridegroom, a gay and yet massive style of cow, preparing for the York Fat Show, was the last tenant of the kennel loose-boxes; and when we had noted down the similar fate of Lady Griselda the dam of Bon Garçon, who rancorously refused to breed after his birth, we passed out to see the heifers in the fields behind.

Among the first group of six, was Blue Bonnet by Lord Clarendon (14807), who was sold into Ireland for 200 guineas; Garcia, a capital own sister to Gardoni, and a thick blood-like yearling, with very neat offal; and Le Bon by General Bosquet, a half-sister of Lawn Sleeves, of great size and substance, but not so elegant as some we had seen. The latter remark also applies to Vanille by Robinson Crusoe, a fine cow-like heifer, and three crosses from Verbena, through her dam Valentine. Over the rails, was another group of six, headed by Marchioness, a grand level heifer; but not so stylish about the head as the white Mayflower, who, as it seemed to us, was also rather neater in her quarters, and perhaps the gem of the three. Cerito claims no particular notice, except that she was the only one in the herd that showed any plainness over the rumps.

And so we retraced our steps to the park to see the herd matrons. The great and good old Lady Fanchette was among the first to catch the eye; but, alas! Old Father Time has dispensed his fool's fat with such a liberal hand, that we shall believe the pillion rumps of Mason's Gaudy to be a myth no longer. Near her was Leda by Lord Marquis, from Laura by Whitaker's Petrarch, and the dam of six calves, including Lawnsleeves, Le Bon, Magenta, and a calf by Bridegroom, which went at four months old to America for a hundred and twenty guineas. Land's End was there too, in the shape of a nice compact small cow, and calved in the December of the same year that her half-brother John o' Groat saw the February light. She's Coming Again, a cow of great length, is about to perform the same feat in full accordance with her name, and we were assured that we should meet with "Off She Goes," the next week at Sir Charles Tempest's. Lovely, the dam of Robinson Crusoe, was a red and somewhat old-fashioned cow, with a nice head, and has done her duty faithfully to the herd with seven calves in ten years. Valentine, the dam of Vanille, was a thick, red, and low cow of great character, and with a beautiful udder; Clairvoyant, the dam of Solferino, not very level in the top, but remarkably deep; and though Sultana's back did not just please us, we had no other mark against her name.

There were many others that we might have mentioned, but our notes were running beyond their limit, and we were glad to change the venue to the interior of the hall, for the half-hour which still remained. It was not, after all, an unnatural transition from calves with the martial and political names without, to the suits of ancient armour and the rallying room of the great Yorkshire Orange party, whose leadership has descended from father to son, within. Sir Thomas Fairfax, too, was reflected through his sword and his candlesticks, which hung, with Oliver Cromwell's hat, in the rich oak-pannelled entrance. There, however, the chain of connection with the herd ceased. Not one bull stirred up the remembrance of its Royal triumphs on canvas; and we felt as one green silk curtain after another was drawn aside, by the hand of our host, that there must be a deep truth in the words of the author of *Horæ Subsecivæ* when he spoke of the six great sights of his life, and classed the Pyrenees, the Venus of Melos, Titian's Entombment, and Paul Veroneze's Cain, with his wife and child, and The Rhine under a Midnight Thunder Storm at Coblentz, with the wondrous Turners at Farnley Hall."

H. H. D.

ON THE ORIGIN, DISTRIBUTION, AND IMPROVEMENT OF THE BREEDS OF DOMESTICATED ANIMALS.

Returning to this subject after a longer interval than at first anticipated, we propose in the present article briefly glancing at the history of the horse: his deterioration (if we may be allowed the phrase) into so many breeds, and the improvement of them by various modes of management, in order to suit the progress of things.

When speaking of the origin of the ox, it will be recollected we observed that the fact of Noah being commanded to preserve clean beasts by sevens, *i.e.*, "seven, seven," or seven bulls and seven cows, at the Deluge, left room for the argument of a variety of breeds; but in the case of the horse, there is no such field for speculative controversy, for the inspired penman plainly and infallibly informs us, he was to preserve "beasts that are not clean by two, the male and his female," only so that at the flood, when the second father of mankind descended into the plains of Armenia from Ararat, he had only one horse and one mare of the species *Equus caballus*, from which to breed. In the former case it may be argued, for instance, without fear of contradiction, that Noah having seven bulls may have had just as many breeds from which to stock the world; but of horses there was only one variety of each species, whatever that particular variety or breed may have been, from which the numerous breeds now dispersed over it have sprung.

The origin of our breeds of horses is, therefore, a very simple affair, for thorough bloods, dray-horses, Shetland ponies, &c., &c., are all derived from one source—the single pair preserved at the Flood. Infidels, who deny the truths of the Bible, or the accuracy of inspired writers, may catch wild horses in Arabia, Persia, India, or Africa, so as to solve the question at issue by other means; but Christians are driven to no such miserable shifts, for man once in possession of this invaluable servant, it is manifest he never would lose sight of him, in climates where he could live. Profane history may be silent for a time, but from the days of Noah downwards the horse has lived in a domesticated state with man. Among the Assyrians, Babylonians, Egyptians, and early nations of antiquity, he appears to have occupied as prominent a place, judging from the sculptures of Nineveh, Babylon, Thebes, &c., and other relics handed down to us, as he does at the present day, and in all likelihood will continue to do so to the end of time, independent of "iron-ways" and steam locomotion, which are annually giving rise to increased opposition to his usefulness.

The individual breed preserved by Noah, however, at the Deluge, is a question involving more controversy; but the almost unanimous conclusion of every age has pointed to the blood horse, while this conclusion is now being forcibly corroborated by the sculptures lately and still being dug from the ruins of the oriental cities already referred to. The language of Job again (xxxix. 19, 25) is unmistakably applied to this noble animal, for to no other breed could he address himself in the same strong terms. No doubt the language is poetical; but the poet, who was not only inspired, but learned in all the wisdom of the Egyptians and Chaldeans, had obviously his eye, not upon the far-famed descendants of the steed which carried Mohammed from Medina, such not being in existence for upwards of 2,000 years afterwards, but the breed (and in all likelihood purer breed, as we by-and-by shall see) from which they had sprung; in other words, the facts of the case, the blood-horse himself as he existed in the days of the patriarch.

To uphold the standard of this unrivalled breed, we may further observe that—granting that physical circumstances before the Flood were similar to what they have been since, producing similar effects, and that there were consequently as great a variety of antediluvian breeds of horses as there has been since—the probability is in favour of Noah selecting from among them that breed nearest the original type when the horse came from his Maker's hands in a perfect state. Indeed, when we take into consideration the fact that the preservation of man and beast was the work of an overruling Providence, the conclusion becomes manifest that the breed, when it descended from the ark, was nearly as pure as when it left Paradise, if not equally so.

The great diversity of breeds which have since taken place, or which have sprung from one original pair, is the result of physical causes, natural and artificial—natural, such as the breeding from unhealthy or improperly-formed animals, or the influence of climate; and artificial, such as management at the hands of man. To some one or other of these causes, or combinations of them, are to be attributed the numerous breeds of horses now inhabiting the different kingdoms of the world, of which this country probably exhibits a greater variety than any other—the blood-horse, the dray-horse, and Shetland pony being conspicuous and extreme examples.

Although our limits prevent us from entering upon the practical details of this division of our subject at any length, it will yet be necessary to cast the eye hurriedly across them, in order to be able to enter more successfully upon the most important division of it, viz., the improvement of breeds; for "as to find out the seat of the disease is to effect half the cure," so, in accordance with the old proverb, if we can form but a general idea of how the huge old English cart or dray-horse and Highland shelty have been produced from the blood-horse, it will be a more easy task to arrive at correct conceptions relative to that reformation of breeds which the peculiar exigencies of the times demand.

For a long period after the Flood, the horse appears to have been used only for military, hunting, and pleasure purposes; and to this day, in the East, these are almost the exclusive branches of usefulness to which his strength is yet applied; for throughout Turkey, Egypt, Persia, Tartary, &c., oxen perform the principal amount of labour connected with agriculture, both ploughing and carting, while the camel supplies any balance wanting in connection with commerce. It is only in modern Europe and America that the horse has superseded the ox in the cultivation of the soil; for at no great date, war, hunting, and pleasure were also the only purposes to which he was applied in England herself.

This practice must necessarily have exercised an unfavourable influence upon the physical character of the horse, and the stocking of the world with his offspring, especially when we take into consideration the warlike reputation of the period, for the best animals must either have been slain in battle, or bred from after they were disabled from carrying arms, and hence with constitutions and health impaired; while the awful calamities resulting from war and the famines with which Oriental nations were so frequently visited, according to sacred history, must have produced an equal, if not greater effect; so that by the time of Mohammed a very considerable deterioration must have taken place; while modern history proves that the Arabs, with all their attention have failed, generally speaking, to maintain this level, the horse having deteriorated under their management.

This deterioration in the East has in all probability been greater since the downfal of the Assyrian, Babylonian, Median, and Persian kingdoms of sacred writ than previously; the irrigation, and indeed the entire agricultural resources of these kingdoms, having since then been neglected; large areas, which once yielded an abundance for man and beast, being now a barren desert, or only yielding herbage capable of supporting a stunted race of horses. The testimony of Xenophon, who lived about a thousand years prior to Mohammed, relative to the cavalry of Media, points to heavier and more powerful horses than Arabia can produce, or any Oriental state; and the sculptures of Nineveh in some measure confirm what this celebrated writer says; for the Assyrian artist must have had his eye on a more powerful race of blood horses than are now to be found in the Sultan's cavalry of Bagdad, or, we may perhaps say, any stud of blood horses in the world; while the description given by Job, who lived a thousand years prior to Xenophon, has especial reference to *the strength of the horse.* Now, it is hardly possible that a decrease should have taken place in the former period equal to what has been experienced in the latter; for between Job and Xenophon those kingdoms were progressing in science; and therefore it is not likely that an animal occupying so important a place as the horse did would have been neglected, while between Xenophon and Mohammed and the present time the vials of justice have been poured out upon them, no domesticated creature being able to escape the consequences. But in the absence of more circumstantial evidence relative to the former period, since the deterioration during the latter cannot be denied, or rather is confirmed by modern history, the opposite conclusion would only point to a higher degree of qualifications on the part of the blood horse originally than we have even supposed. No doubt it may be said that the Assyrians and Medes improved the breeds since they progressed in science; but their progress in science was of a limited kind, for it is very problematical if they had even attained to that level which existed at the deluge, when Noah constructed such a building as the ark, or even his immediate offspring, who erected the Tower of Babel. Royal studs were doubtless carefully attended to, but in ninety-nine cases out of every hundred only to become the victims of man, and its consequences. The dispersion of mankind at the confusion of languages, their division into hostile tribes, and the parting of cattle among them, with the many consequences which followed, could not fail, we say, to add to the calamities of the horse hitherto sharing in common those of his master. Every argument deduced from history, either sacred or profane, thus points to the horse as a more powerful animal originally than the East now exhibits, and that during his early history he has unfortunately had more than a fair share of the calamities of man.

Nor has the wild horse of the desert, who separated himself at an early period after the Flood from the parent domesticated herds, escaped the disasters which have befallen his country; for it would be absurd to suppose that he, taking the oriental for our example, is a fair representation of the primitive pair, since causes nearly as effective as those which have given birth to the Highland pony have for upwards of three thousand years been operating actively upon his constitution, owing to the decline of the country. We may just as well, if not more correctly, suppose that the wild horse on the steppes of Russia, or pampas and prairies of America, or our own Highland glens, has undergone no change, and is therefore a perfect type of the original; while well-authenticated facts prove that very important changes of a physical character have taken place, and that they, the different herds, differ widely from each other, and hence from the parent stock or single pair from which they and all others have originally sprung.

Wild herds have, no doubt, assumed a standard type under the different circumstances to which they are subject, wherever those are of a uniform standard; and it would be an important acquisition to science to know what those different types and circumstances are, and what they best qualify the horse in each case for—whether for racing, cavalry, hunting, farming, or other purposes. We believe that in each case speed has been gained, and hence power lost, other things being equal, and that the senses have become more acute and active. These are the natural results of a more frequent exercise of certain muscles and nerves, and the less frequent exercise of others; and they form important data in the improvement of breeds, or of the blood horse himself, as we subsequently shall see.

It has, no doubt, been truly said that the wild horses of Russia are stronger than the tame ones; or, without going so far from home for an example, the same will be the case with Welsh and Highland ponies—the wild being stronger than the tame, as some of our readers have doubtless experienced, while they are fleeter also; so that the mechanical proposition quoted above, as to speed being opposed to power, falls to the ground; but the objection is based upou the erroneous hypothesis that other things are equal, while the muscular condition of the two are widely different, and is therefore easily refuted.

Following the distribution of the horse northward to Britain, very serious inroads must have been made upon his original type and constitution during the long reign of Druidical superstition and barbarity, when he along with other animals were exposed to all the rigours of our climate, and the subsequent importation of Saxon, Danish, and Norman blood failed to restore them to their pristine purity. Indeed, long before he had got this length, the vicissitudes of the climate of the continent of Europe, coupled with the consequences of that warlike age, must have produced important changes, unequalled probably, save in the highland districts of this country, which, to this day, illustrate in a very forcible manner the influence of the weather with an irregular supply of food, feasting in summer and starving in winter, upon the physical system of the horse. Indeed, every province of the kingdom bears ample evidence to the fallen condition of the horse, different breeds only presenting different degrees. The cart-horses, roadsters, &c., exhibited at the Royal Agricultural Society's meetings are obviously great improvements upon old times.

THE PRODUCTIVE RESOURCES OF THE CAPE COLONY.

From people who quarrel and differ we often hear many truths which might not otherwise come out. And of this we have an exemplification in the state of affairs just now at the Cape Colony. The important and growing eastern section of that Colony considers it has attained a position sufficient to entitle it to separation or independence from the older western province, to which it is now linked. The colonists who look upon Graham's Town as their centre have for some time past been putting forward prominently their grievances, and instituting comparisons between their own advance and position as compared with those of the western section, of which Cape Town is the capital and head-quarters. With the political, financial, and local grievances it is not our province to deal; but in the agricultural and industrial progress we at home have an interest.

The colonists urge many sources of complaint, arising from legislation at a distance of 600 to 800 miles, want of due participation in the legislation and the imposition of taxes, &c., and hence demand local self-government and independent separation of the two provinces, or a federative separation. They ground their arguments upon the cases of the separation of Port Phillip and Moreton Bay from New South Wales, to which they were formerly attached. The political features of the case we shall not touch, but there are valuable statistical details brought forward in furtherance of the argument, which deserve more than local circulation, as evidence of the remarkable strides making in the pastoral progress and general wealth of the Cape Colony.

At a time when the merchants and others connected with the Cape Colony here are honouring Sir George Grey with a public dinner, it seems not to be inappropriate to pass in review the progress of South Africa, to which his policy and fostering care have so largely contributed of late years. Few governors have so fully earned the general good-will of the colonists, and it is satisfactory to think that he will probably return to resume the reins of government, which he has administered so ably and satisfactorily already. If Sir George does receive the renewed appointment, let us hope that he may go back with full powers to deal with this mooted question of separation or federation, to which he has already given so much attention.

We now proceed to give a summary of the statistical details to which we have already alluded, which we publish for their authenticity and value, for general information, totally irrespective of any bias in the dispute between the two divisions of the colony. The area of the western province appears to be 68,661 square miles, and its population at the present time, including Kafirs, 133,000. The area of the eastern province is 58,052 square miles, and its population 169,000 souls. These areas do not include the vast additions made by his excellency Sir H. Smith, in 1848, when he gave the Colony its natural northern boundary, namely, the southern bank of the Orange River. While the western province is confined on two sides by the ocean, and on the north by an impenetrable desert, and consequently inexpansible, the eastern province has an illimitable extent of fertile lands on its north and north-eastern portions, all the exportable produce of which must flow through the sea-ports of that section; in fact, there seems scarcely any assignable limit to the growth of its commerce and influence.

From the return of the valuators of the respective amounts of the fixed property in the two divisions, appraised by order of the Government in 1844, it appears that the value of that of the western province was £3,554,008, and of the eastern province £2,112,472. A fresh valuation was, however, made this year, which there is every reason to believe will show a large preponderance in favour of the eastern province, owing to the increased value of property, the establishment of numerous new towns, villages, and hamlets; the large number of new and substantial buildings erected in the last fifteen years; the increased security, by the present policy, of life and property from Kafir spoliation; and the general prosperity of the province.

Let us pass on now to the relative number of stock in 1857; and we throw this into a tabular form:

DESCRIPTION OF STOCK.	WESTERN PROVINCE.	EASTERN PROVINCE.
Horses	64,186	74,761
Asses	6,868	299
Mules	7,462	1,188
Cattle	141,245	307,141
Sheep, woolled	763,493	4,064,546
Ditto, African	487,979	1,143,534
Goats	375,478	881,115
Aggregate value	£2,851,358	£6,405,521

The average value at which the different head of stock are computed is given as follows, forming an index of the prices of domestic cattle, &c., in the colony:—Horses, £16 4s. 3d.; Asses, £26 14s. 2d.; Mules, £18 0s. 3d.; Cattle, £5 11s. 4d.; Sheep, 12s. 6d.; ditto, African, 9s. 6d.; Goats, 8s. 6d.

The quantity and value of the wool exported from the two divisions of the Cape Colony respectively, in periods of five years, have been as follows:—

YEARS.	WESTERN PROVINCE. lbs.	EASTERN PROVINCE. lbs.
1830	38,907	4,500
1835	136,020	78,848
1840	509,597	401,521
1845	1,109,554	2,085,064
1850	1,589,277	4,323,650
1855	2,326,167	9,690,250
1857	3,702,961	14,064,261

The enormous expansion in the wool production and export from Algoa Bay is remarkable, and an earnest of what may yet be looked for as population increases and settlement extends northward. An aggregate present export of close upon 18 million pounds of wool from our Southern African colony, showing a three-fold increase in seven or eight years, speaks well for the progress and energy of the sheep farmers of the Cape. We need not go over, in detail, the whole of the industrial products of the colony, but may select some of the most important. Thus, the western province raises 622,135 bushels of wheat (nearly double the quantity grown in the eastern province), 317,205 bushels of barley (four times the amount of the eastern), three times the quantity of dried fruits, and 32,677 pipes of wine, while there are only 1,500 made in the eastern provinces. But there are some other staples and food products, in which the eastern province far exceeds its neighbour, thus:—

	WESTERN.	EASTERN.
Oats, bushels	520,776	1,788,000
Maize "	11,440	181,103
Potatoes "	72,096	164,411
Oat-hay, lbs.	18,720,896	23,654,745
Aloes "	73,264	1,613,380
Butter "	153,152	246 837
Tallow "	267,924	396,329
Soap "	71,426	219,612
Hides & skins	281,655	384,123

We have not space to follow, in detail, the figures illustrating the commercial progress and progressive growth of the two provinces of the colony, as shown by their respective imports, exports, customs, revenue, &c.; suffice it to state that the first direct commerce from the eastern province only commenced in 1826. In 1830 the imports of the western province were of the value of £402,319, the exports £210,764, and the customs' revenue £22,031. The imports of the eastern province were £18,455, the exports £24,439, and the customs' revenue £688. The returns for the year 1857 show a remarkable change. The imports of the western province in that year were £1,354,636, the exports £746,960, and the customs' revenue £131,073. For the eastern provinces the imports were £1,282,556, the exports £1,084,640, and the customs' revenue £122,035. The younger province of thirty years of age, therefore, now nearly equals, in all these branches, the elder division of two centuries' settlement, with the advantages of Table Bay and the port of call.

From these general details and instructive figures we find, then, that the eastern province of the Cape colony only came into existence as a place of British settlement in 1826, yet it now exceeds in population the elder or western province, founded in 1652. Notwithstanding three devastating Kafir wars in 1834, 1846, and 1850 (confined to the eastern province), in the value of its fixed property it is equal, if not superior, to the western—outstrips it by more than double the value of stock, is richer in its industrial products, is almost equal in the sterling amount of its imports, largely superior in the value of its exports, and its one staple wool outweighs in value those of the western province, wine and wool, by £361,000.

As a case in point to that under notice, it may be added that when Port Phillip (the present important and flourishing colony of Victoria) sought separation from New South Wales, and gained its object, it had only a population of 25,000 souls. Its live stock consisted of 7,076 horses, 187,973 cattle, and 1,860,612 sheep; her wool shipments were only 4,823,785lbs., her imports but £205,389, and her exports £342,623.

We place these statistical facts prominently before our readers at their winter firesides, because they are useful for general reference, and valuable indications of the advance making by English and Dutch farmers and settlers in this important southern British colony, to which, under the auspices of the Colonial Government, many emigrants are now proceeding.

THE FORCES USED IN AGRICULTURE.

A PAPER BY MR. J. C. MORTON,

READ AT THE SOCIETY OF ARTS, WEDNESDAY, DEC. 7, 1859.

J. BENNETT LAWES, ESQ., IN THE CHAIR.

The three forces to which I shall refer are steam-power, horse-power, and manual labour. Each of them has employment in our present English agriculture, and one object of this paper is to point out the extensive fields open, especially to the first and last of them, in the agriculture of the future. For there are three classes under which all the operations of the farm may be arranged, and they correspond exactly to these three forces which we have at our command.

In the first, where the greatest uniformity of process obtains, the greatest power is needed, and a purely mechanical force, acting through levers, wheels, and pulleys, is in this way sufficiently under our control for their performance, and this class of operations increases in extent and in importance with almost every permanent improvement of the land, *i. e.*, with everything which tends to the uniformity of its condition. In the second class as much force is needed; but rocky subsoil, awkward hedge-rows, crooked roads, and scattered produce, interfere with any possibility of uniform procedure. Some machinery, more pliable than cranks and rods, is needed by which to carry out the purpose of the mind; and here, therefore, it must work by means of the teachable and powerful horse. This class of operations diminishes in extent and importance with every permanent improvement of the soil, *i. e.*, with every removal of those obstacles to which I have referred. In the third class the care and cultivation of individual life, vegetable and animal, are concerned; no great power is needed, but there is need for the constant and immediate exercise of the will, varying, it may be, at every successive moment; and here, therefore, the human mind can work only by its most perfect instrument—the human hand. It is plain that everything by which on the one hand land is brought to a uniform condition, and by which, on the other, the quantity of its living produce is increased, will extend the first and last of these three fields of agricultural operations, and will diminish the necessity of employing horses.

And this is no mere speculation: it is the principal lesson of the agricultural experience of the past few years. If we knew for several successive years exactly the employment of our agricultural labourers, its nature, its quantity, and its reward on each of the farms which make up the surface of Great Britain; and if we also knew the quantity and the manner during all these years of the horse-labour of all these farms, its cost per acre and its effect; and if, in addition to all this information, we had the full experience, now very considerable, of the use of steam-power upon the farm, not only for threshing and grinding and cutting, but for cultivating the soil, we should certainly learn from it how rapid has been the extension of those circumstances under which steam cultivation becomes possible, and how perfectly along with it the demand for agricultural labour has been maintained. Such a review of agricultural experience, would, however, teach us more than this, for by a comparison of the experience of different farms we should learn the most economical mode of obtaining these powers, and the best way of applying each within the field thus open to it. We should learn how to ensure the most economical and efficient condition of our steam engine and its machinery; we should learn how to obtain the most economical and efficient horse labour; and by so large an experience those circumstances would be pointed out under which the best farm servants are to be procured and retained.

The forces used in agriculture, thus considered, form, therefore, a very extensive subject, and it is only two or three illustrative remarks under each of these several aspects of it that can be made within the hour.

In the first place, then, let me attempt a more particular comparison of steam power, horse power, and hand power for the cheap performance of mere labour. In describing steam-engines the term "horse-power" is used as a unit of force. The power exerted by a horse is assumed, on the authority of experiment, equal to the pull or lift of 33,000 lbs. 1 foot per minute; and to this agricultural experience agrees, for if a pair of horses draw a plough along with an average pull of 300 lbs. at an average rate of 2½ miles per hour, *i. e.*, of 220 feet per minute, it is the same as if those 300 lbs. were pulled over a pulley, *i. e.*, lifted that height in that time, and 300 lbs. lifted 220 feet per minute is just the same as 66,000 lbs. lifted 1 foot high per minute, which, as the performance of a pair of horses, is exactly the 33,000 lbs. apiece at which their force is valued by the engineer. Now, it is not on a comparison merely of the *cost* of horse power in the animal and in the engine that so great superiority of the latter will appear as really belongs to it. In addition to this, the performance of which they are severally capable must be taken into account. An ordinary 10-horse power locomotive agricultural engine will, according to the Chester judges of the work done by Fowler's steam plough there, cost in coals, oil and water, and attendance, and tear and wear of implement and engine, but excluding interest on capital employed, nearly 45s. a day, or about 4s. 6d. an hour, which is 5½d. per hour for each nominal horse power exerted, but as the real force exerted is more often that of 20 horses in the case of a 10-horse power engine, we must really divide this by 2, and call steam-produced horse power worth 3d. per hour. Now the cost of horse labour on 21 farms in different parts of this country, of which the particulars have been kindly given to me, did not exceed 5d. per horse for each of the working hours of the year. Those farms employ 282 horses, and they cost for food, for depreciation of value and saddler's and blacksmith's bills, £7,815 a year; their implements need £870 a year to keep them good; and the ploughmen and boys employed about them cost £4,241 a year in wages—about £13,000 in all, or £46 per horse per annum; and supposing that there are 2,500 working hours in the year, this is rather less than 5d. per horse per hour.

Besides this, the estimated expense of Fowler's engine was, I believe, excessive, and the nominal power of it was certainly below the actual force at which it could be worked with the estimated quantity of coal consumed; for of 30 engines tried at Chester only one consumed the 11 lbs. of coal per hour for every horse power produced, which is the consumption named for

Fowler's engine, and the majority did not consume more than 6 to 8 lbs. during that time.

A horse at plough with an average length of 120 yards of furrow loses one-third of his time on the headland in the mere act of turning the plough. At the dung-cart not one-third of his time is employed in the actual conveyance of the load, two-thirds are lost standing at the heap and in the field and returning with the empty cart. Or rather let me say this loss of time is a necessary part of his employment, however he may be engaged. He can pull 33,000 lbs. 1 foot high in a minute, but he cannot keep that performance up for 10 hours at a time.

On six farms the details of which I have so ascertained as that all the ploughing, scarifying, harrowing, rolling, horse-hoeing, carting—all the horse labour in fact on each—is converted into lbs. lifted so many feet per minute throughout the working year, I find that the actual performance per hour through the year is not 33,000 lbs. lifted 1 foot per minute, but more nearly one-half that quantity, varying from 14,000 lbs. in the lowest case, to 19,000 lbs. in the highest.

No doubt, even in the case of steam power, there must be periods of waste labour—ploughs must be turned upon the headland even if it be done by steam; but these occasional periods of comparatively fruitless work are no necessary condition of steam power; *it* is better if maintained continuously, and machinery will be invented to reduce this waste time to a minimum with a positive advantage to the efficiency of the engine. Whereas in horse labour, the waste time is necessary for the maintenance of the power itself. And it is plain that, along with the 5d. per hour for every horse, which on the average it may cost, there has to be taken into account a performance on the average of the year of only 19,000 lbs. lifted by it 1 foot high per minute as its best result; whereas in the case of the steam-engine *its* 3d. per horse per hour has to be taken along with nearly twice as large a performance as *its* best result.

And the relative cost of the two forces is affected not only by the question of time during which each can be continuously maintained, but also by the quality of the performance of which each is capable. In thrashing, uniformity of speed is a condition of good work; it is more easily maintained by steam power than by horses. In ploughing, the avoidance of trampling and of pressure generally is almost a condition of good work; it is more easily obtained by steam-drawn machinery for the purpose. But to this I shall recur.

Let us now estimate the cost of manual labour engaged in what I call mere work, *i. e.*, where the least degree of skill is called for. I have four facts in illustration of this point:

1st. A man will dig 8 perches of land, or say 2,000 square feet, nearly a foot deep, in a day. In doing so he lifts probably three-quarters of it through at least a foot in height, that is to say, he lifts 1,500 cubic feet, weighing at least 150,000 lbs., 1 foot high in 10 hours' time, and to do it therefore he must maintain upon the average a lift of 250 lbs. per minute all that time. Of course, in addition to the mere lift, there is the labour of cutting off this earth from the firm ground to which it was attached. In my second case, then, this portion of his labour is very much reduced. 2nd. Three men will lift—I have often paid them for doing it—100 cubic yards of farmyard dung, and fill into carts in 10 hours' time. The 33 cubic yards which fall to each man's share, or about 14 cwt. apiece, weigh 50,000 lbs., and this is lifted over the hedge of the cart, or 4 feet high—equal to 200,000 lbs. lifted daily 1 foot high, or 330 lbs. per minute. This is one-fourth more than in the last case. Now take one where there is no labour in detaching the weight from any previous connection. 3rd. A man will pitch in an hour's time—I have often seen him do it—an acre of a good crop, tied in sheaves, to an average height of full 6 feet, on the cart or waggon. Straw and corn together, such a crop will weigh more than 2 tons, say 5,000 lbs. In doing this he therefore lifts 300,000 lbs. 1 foot high in 10 hours' time, or 500 lbs. per minute. 4th. My fourth case is of much the same kind. One man and five boys, or women, equal as regards wages—and I will therefore assume equal as regards power to three men—will throw into carts upon an average, of swedes and mangel wurzels, 3 acres of a good crop, say 70 tons in all, in a day of 9 hours' length. They lift, then, 150,000 lbs. 4 feet, being, say 600,000 lbs. 1 foot; being 200,000 lbs. apiece in 9 hours' time, or about 370 lbs. a minute.

These four cases indicate the mere force of a man, then, at a cost of, say 3d. an hour, as equal to a lift of 250, 330, 500, and 370 lbs. per minute; the two former being cases where the load has to be detached as well as lifted, and the third being performed under the influence of good harvest fare.

But now compare this, even in the best case, with the duty of a steam engine, or 33,000lbs. 1 foot high per minute for 3d. an hour, and compare it with the actual average performance of the horse, 16,000lbs. lifted 1 foot per minute for 5d. an hour. In order, at the best rate named, to do the work of the steam-engine, 66 men would be required, at a cost, not of 3d., but of more than 15s. per hour; and in order to do the work of the horse 32 men would be needed, at a cost of 8s., instead of 5d., an hour. It is plain that if we can take much of the mere labour of the farm out of the hands of the labourer, and put it into the hands of steam power for its performance, there is an enormous amount of saving to be made in the cost of agricultural production. It is plain that it is mere folly in the labourer to think that, as regards the *mere* labour of the land, he can compete with either steam-power or horse-power. Strength of body is desirable, and sinew hardened by long practice in hard labour has a considerable marketable value; for that, however hardly it may sound, is the aspect of the matter in which the interests of the labourer most directly appear; but it is plain that for sheer lift and the mere putting forth of force, horse-power, and still more that of untiring steam, must grind the soul out of anybody that shall pretend to competition with them. It is in the cultivation, not so much of mere strength of body as of skill and intelligence, that the safety of the labourer lies, and in his capability of education he is perfectly secure.

As the matter at present stands, then, and confining ourselves to that large and increasing class of operations in which the power required is great and the process almost uniform, and looking only to the cost per unit of work done, we have seen that steam-power stands decidedly first in the race; horse-power is a tolerably good second, and the agricultural labourer is literally nowhere. There are, however, two considerations which greatly affect the position of horse-power in this competition, and place it much further back than it would at present seem to be. They both affect its fitness for those acts of cultivation where it is plain that there is the greatest room for an extended use of steam-power. I refer, first, to the injury done to the land by the trampling of draught animals; and secondly to that irregularity of employment on the farm for horses during the year, which in effect makes you keep upon a large farm several horses all the year round for the sake of their work during a few weeks of spring and autumn. If a steam-engine, which costs nothing when it is idle, can be used to take this extra work, and so reduce the horse labour of the farm to an uniformly monthly amount, then its cost has to be compared, not with that of the horses which it has displaced only during the few weeks in question, but with the cost of those horses throughout the year. It is this fitness of the engine for the cultivation of our stubbles in autumn, and so its power to displace so many teams throughout the year which would otherwise be kept just for the few weeks of most laborious time, that greatly heightens the economy of its employment. And as to the superiority of its work of cultivation, I will just quote the statement of a ploughman on the clay land of the oldest steam-cultivated farm in England—Mr. William Smith's farm, of Little Woolston, in Buckinghamshire—that in turning back the wheat stubble in the autumn with the horse-drawn plough, he used often to uncover the foot-prints of the horses' shoes which had trod there at that depth when turning in the bean stubble for the seed twelve months before. Of course it is no part of good agriculture that all the produce of the land is to be made out of a particular layer called the soil, which has to be cultivated, turned to and fro, and stirred and mixed upon an impervious floor hardened by a perpetual trampling, below which lies the subsoil. All recent improvements of the soil have proceeded upon the idea that there is no essential or necessary distinction between it and the subsoil—that *thorough* drainage and deep cultivation both increase fertility, and that the existence of anything like a pan within thirty inches of the surface is injurious. The ability of steam-power for the deepest cultivation, and its applicability at the same time to the thorough cultivation of any depth to which it may be desired to stir or turn the soil without any pressure on it except by the wheels of the implement employed, must ultimately obtain for it the preference over horses for all mere ploughing and stirring, especially of clay land. And a very large share of the horse-labour of ordinary agriculture will thus be handed over to the steam-engine.

Let us consider how much. I will refer to three instances. On a farm of 675 acres, occupied by Mr. Melvin, at Bonington, near Ratho, in West Lothian, the whole horse labour of cultivation and carriage being converted, as I have already said, into weight lifted, amounts to upwards of 100,000 cwt. pulled, *i. e.*, lifted one mile per annum. Of this the ploughing and scarifying alone amounts to 27,000 cwt., or more than one-quarter; the harrowing, rolling, and drill cultivation amounts to upwards of 20,000 cwt.; and the carriage of dung, crops, and produce amounts to 60,000 cwt. lifted one mile. The carriage is here an enormous proportion, more than one-half of the whole horse-labour of the farm, and much beyond its average amount in ordinary experience; but still even here one-quarter of the horse-labour goes in mere ploughing, which can all be done by steam-power, and *so* done as that an eight-horse-power engine shall displace more than eight horses, and do their work much more effectually.

Again, on a farm of fen land of 790 acres, occupied by Mr. Aitken, near Spalding, Lincolnshire, where the horse-labour of the farm is nearly the same as in the last instance, or equal to 100,000 cwt. lifted one mile per annum, the carriage does not exceed much more than a quarter of the whole, while the ploughing is nearly 40,000 cwt., 4-10ths of the whole labour, and the harrowing and rolling about 35,000 cwt. per annum.

On Lord Ducie's farm at Whitfield, Gloucestershire, 260 acres, the horse-labour amounted to 37,000 cwt. lifted one mile per annum; and of this 12,000 (one-third) was carriage, nearly 15,060 (or 4-10ths) was ploughing and cultivating, and the remainder harrowing, rolling, and drill culture. This seems to be a pretty ordinary division of the labour; and if it applies generally to arable land, it would appear that though farm-carriage and all the lighter work of harrowing, drilling, and rolling continue to be done by horses, there are still 4-10ths of the horse-labour of the farm which may be done by steam. I know that a great deal ought to be said of the great advantage of this substitution, owing to the more thorough performance of the cultivation which steam-power will accomplish. Ample evidence exists on steam-cultivated farms in this country on this point; but I will leave it to be adduced by others who may follow me, and I will continue to speak merely of the saving of the expense which is thus effected. It appears, then, that on arable land two-fifths of the horse-labour of the farm can be handed over to a power which is capable of nearly twice as much duty for about one-half the expense. One other remark on this point, and I have done. On examining the horse-labour of a farm of 240 acres of arable land under alternate husbandry, it will be found that it does not much exceed 500 days of a pair of horses in the year, and that need for it is distributed among the months extremely unevenly. Not more than 35 days of a team per month are wanted in December, January, and February; about 45 days a month are wanted in March and April, May, and June; about 15 days are wanted in July, about 60 in August, 90 in September, and 55 in October, November, and December. August and September stand highest; and as there are not generally more than 24 working days in each of these two months, there must be a provision of at least 3½ pair of horses all the year, in order that the work of August and September may be done. Now the two-fifths of the horse labour, which is proper for steam power, is not going merely to displace two-fifths of these seven horses through the year; for the ploughing and cultivating, being done by steam, will take, not two-fifths, but more than half of the labour of the incumbered months of March and April, May and August, and September and October, and so reduce the amount to something like 35 days' work during each month of the year, which two pairs of horses will more than easily accomplish.

I believe, then, that by steam-power at least three out of every seven horses on arable land may be dispensed with all the year, at a cost not exceeding the cost of these horses during the three or four months when alone they are really needed on the land.

The first-class of operations then upon the farm, which includes the ploughing and turning of the soil, will be taken by steam-power out of the field of horse labour, just as threshing, and cutting, and grinding have been taken by it out of the field of hand-labour.

To the second division of farm work I shall refer but very shortly. It includes such cases of ploughing and cultivation as are taken, by very rocky subsoil and very crooked hedgerows, out of the scope of the steam-driven plough; it also includes the lighter class of horse-work, such as harrowing and horse-hoeing, which however might very well be done by steam; and it more especially includes the work of carriage, which, considering the scattered position of the produce to be collected, and the crooked roads along which it must be drawn, I see no probability, as long as these remain, of getting done except by horse-power and manual labour in the usual way. Mr. Halkett does, indeed, propose to remove these obstacles, and is therefore able to accomplish all by steam. The third class of operations includes the lighter work, requiring skill and thought as well as labour. The planting of seed equidistantly within the land may be done by machinery, but the culture of the young plant, much of the hoeing of the land immediately around it, and its treatment during growth according to its condition, must be left to the hand. When ripe it may be harvested by horse-drawn implements: our corn crops are reaped, our potatoes may be dug, and roots cut from the ground by horse-drawn machines—they must however be gathered into bundles or heaps, and ultimately removed by the help of manual labour.

When stored they are threshed, and ground, and cut, and steamed by steam-driven engines, but they must be administered as food by manual labour. Leaving the vegetable, which, even when living, may be treated to some extent by machinery, and when no longer growing becomes at once the subject of steam-driven processes, we come to the treatment of the animal which it feeds, and here we leave altogether the region of machinery actuated by steam, and are confined to the hand, directed by intelligence.

Is it not a remarkable thing, however, that agriculture, which was once wholly the work of men's hands, but which has long since given up the tillage of the soil, and the carriage of the manure, and the sowing of the seed, and three-fourths of the hoeing of the crops to be accomplished by the horse—which has lately given up the threshing of the grain and the cutting of its straw to be effected by steam-power—which is rapidly abandoning the work of reaping to the former and of cultivation to the latter—should nevertheless require more labourer than ever?—that steam being first, and horse-power second, and the agricultural labourer nowhere in the race, considering the three merely as economical producers of power, the last should nevertheless be wanted more than ever?

The explanation lies in this: that agriculture is more and more becoming the work of intelligence and skill as well as power—those parts of its processes, where intelligence and skill are wanted, are becoming a larger portion of the whole. Cultivation is more perfectly performed, and over a greater extent of land—the crops cultivated require more labour and are more productive—the stock consuming them is proportionally larger and needs proportional attendance. Probably each acre cultivated in 1759 employed more manual labour in its cultivation then than each acre cultivatad now; but how many more acres are there under cultivation now than then? Each bushel of wheat grown half a century ago involved so much more labour then, that 8s. was the lowest price at which it could be grown with profit; but how many more bushels per acre does land upon an average yield at present? Each pound of beef and mutton cost more in wages 33 years ago than now; but we have a double and triple store of food for stock; we have two crops of fattened sheep and cattle where formerly we had one, and each supplies a double quantity of meat.

But, whatever the explanation be, the fact is certain, that the use of steam-power on a farm is a part of that system which employs most labourers in agriculture. Mr. William Smith, of Woolston, who has an 8-horse engine for 110 acres of arable land and 70 acres of pasture, and works this engine only 14 days a year in cultivation, and not more in threshing, employs regularly throughout the year seven men and four boys, equal to nine men upon the whole, or one to every 12 acres of arable land and 8 of grass—"more than any farmer in the neighbourhood employs." His steam cultivation, he tells me, costs him, on the average, 10s. 10d. annually per acre on his clays, and 8s. 3d. annually per acre on his lighter soil. It has displaced exactly the two-fifths of the former horse-power which I had anticipated that it would; and he says that 70 per cent. of the cost of engine-work is manual labour, and only 30 per cent. engine-food, while of the horse-work displaced only 20 per cent. is manual labour, and 80 per cent. is horse-food.

Mr. Pocock, who farms 300 arable acres and 300 acres of grass-land, near Farringdon, employs regularly 22 men eight women, and ten boys, equal to 30 men in all, or one for every ten acres of arable and ten acres of grass. He, too, uses steam-power for thrashing, grinding, and cutting, and employs one of Fowler's steam-ploughs.

Another gentleman, occupying 410 arable and 190 pasture acres, on the fat land below the chalk hills of Wiltshire, and who does all his cultivation by steam, says:

> "Steam cultivation will lessen horse-labour, I think, one-half, and in some cases two-thirds. A neighbour of mine, who has a steam plough, told me that he usually kept 18 or 20 horses: he now hoped to do with six. Another, who occupies about 2,000 acres of arable and pasture, hopes to do with 13 horses. My own impression is, that there will be more manual labour required where steam culture is adopted, and that a more energetic class of men will obtain higher wages."

Mr. Randall, of Chadbury, near Evesham, who cultivates 500 acres arable and 200 acres of pasture, employs, with slight variation, 30 men, seven women, and 12 boys throughout the year, with 70 additional men for three weeks in harvest-time—in all, equal to about 42 men regularly throughout the year, or one to every 12 acres of arable land and five of pasture. He too uses a steam cultivator, and says steam cultivation makes no difference in the manual labour needed on the land. All these, more or less, are instances of the cultivation of clay land, on which, if by force of *character* labour-giving crops are cultivated, of course the labour of cultivation must be greater than on lighter soils. It is these lighter soils, however, generally, which are devoted more especially to the growth of what are called fallow crops; and, taking the ordinary rotation on each class of soils into account, we may, therefore, fairly compare the experience of the steam-cultivated farms, as to the labour they require, with the labour-bills of other farms, though not quite so heavy. This "one man to every ten or twelve acres of arable land, and eight to ten acres of grass," deducting 10s. per acre for the latter, is equal to a labour-bill of 50s. per acre per annum on the plough-land; and it is unnecessary to say that this is a very unusual amount.

On a number of farms in Gloucestershire, whose management I examined many years ago, where the pasture formed from one-tenth to five-tenths of the whole, the labour-bill reached 50s. per acre very rarely indeed. It was more generally between 30s. and 40s.

On a fen farm near Spalding, of which a most elaborate account of the labour used upon it has been kindly given me by the tenant, Mr. Aitken, I find that on 790 acres almost wholly arable, the actual wages paid had during the last three years averaged £1,260, or about 32s. an acre. On another similar farm, near Chatteris, on 900 acres arable and 120 pasture, the last year's wages were £1,556, which is about 35s. per acre on the arable.

On one of the crack farms of East Lothian, of 630 acres wholly arable, 22 men are kept regularly, and 35 lads and women, besides 25 or 30 people for three or four weeks in harvest; and the wages, therefore, must be about £1,200—not £2 an acre—though potatoes, one of the crops requiring most labour, are very largely cultivated.

The wages on the College farm, near Cirencester, of 400 acres arable and 40 pasture, are £700 a-year, or 30s. an acre on the plough land. Mr. Stratton's farm, Manningford, Bruce, near Pewsey, Wilts, 590 acres arable, 65 acres pasture, and 160 down, costs about

£1,200 a-year in wages, or £2 per acre on the arable land. Mr. Dods, of Anick Grange, near Hexham, occupying 310 acres arable and 100 pasture, employs 7 men and 9 women annually, and extra for a month 7 men and 7 women. His wages cannot amount to more than £500, or not much more than 32s. an acre on the arable.

And, as a last instance, I will take the farms of Mr. Edmonds, of Eastleach, near Lechlade, Wilts, 2,000 acres arable and 430 acres pastures, employing on the average, and taking harvest into account, about 120 men and 20 to 40 women. His labour bill must, I should suppose, from his rates of wages, which he has kindly given me, amounted to at least £3,200 a-year, which is 32s. an acre. It must be admitted then, that on a comparison of these figures, the labour paid for upon steam-cultivated farms is even more than on farms where steam-power is used only to drive the thrashing-mill.

Agriculture is, in fact, experiencing the truth taught in the history of all other manufactures—that machinery is, in the long run, the best friend of the labourer. This truth is taught even more impressively by a review of agriculture generally, than it is by the case of any individual farm. Here are we, twenty-one millions of people, producers and consumers, living in this island, on a great farm which we may, by the help of such statistics as we possess, describe as nearly 19,000,000 arable acres, and probably nearly as much grass, employing as farm labour, in-door and out, about 950,000 men and 120,000 women, besides 300,000 lads and 70,000 girls, or averaging them by their probable wages, as has been done before, let us say equal in all to 1,150,000 men, or one to every 17 acres of arable, and nearly as much pasture. We feed and use some 1,500,000 horses, of which probably 800,000 are strictly for farm purposes. We are annually inventing and manufacturing labour-saving machines at an extraordinary rate, and every year at least 10,000 horses are added to the agricultural steam-power of the country, certainly displacing both animals and men to some extent. We have taken the flail out of the hand of the labourer, and the reaping-hook is going; on many a farm he no longer walks between the handles of the plough—he no longer sows the seed—he does but a portion of the hoeing and the harvesting—and yet, so far from being able to dispense with his assistance, he is more in demand than ever he has been.

I have had returns sent to me by all the leading manufacturers of steam-engines for agricultural purposes. Within the past ten years upwards of 40,000 horse-power has been added to the forces used in agriculture in steam alone. If I may single out Messrs. Clayton and Shuttleworth, of Lincoln; Garrett, of Saxmundham; Hornsby, of Grantham; Ransome, of Ipswich; and Tuxford, of Boston, they alone are furnishing 10,000 horse-power annually to the farmer. Messrs. Tuxford, among the first to start the locomotive agricultural steam-engine, inform me that for the earliest suggestion of it they are indebted to Mr. John Morton, of Gloucestershire, then agent to the late Earl of Ducie, who 20 years ago recommended them to put these little engines upon wheels, thus foreseeing the fitness of these powers made locomotive to the circumstances of English agriculture. Messrs. Ransome, of Ipswich, were, I believe, the earliest to receive the commendations and the prizes of the Agricultural Society of England for their engines, and now the leading manufacturers of them, Messrs. Clayton, of Lincoln, send out ten of them each week, or 4,000 horse-power per annum.

Of reapers, again, since 1851 Burgess and Key have sold upwards of 1,900 of their improved M'Cormick's reaper, of which 771 were sold last year; and they now hold four times as many orders as they did 12 months ago. Crosskills have sold 500 of Bell's reaper, and 800 of Hussey's; Messrs. Dray have sold 800 of their improved Hussey's reaper; Messrs. Garrett have sold 600 of Hussey's; 250 of Wood's clever little reaper have been sold last year; and the Cuthberts, of Bedale, who have just begun the manufacture of their equally clever machine, sold 100 before last harvest, and could have sold four times as many. In all, probably 4,000 reaping machines were at work last harvest, capable of cutting more in a day than 40,000 labouring men, and yet there never was such a harvest as the last for the difficulty of procuring harvest men. Notwithstanding all this addition to the forces and the machinery of agriculture, more labourers than ever are required, and, as more labourers are not forthcoming, wages rise.

It is, indeed, possible that some of this general rise in wages of the past two or three years is owing to the labourers in agriculture being, if anything, rather a diminishing than an increasing body; to that I shall refer directly: it is sufficient for the present to declare, what ample experience confirms, that the need of their assistance is increasing.

Of the truth of this, the following is perhaps an extravagant illustration. It is from a gentleman well known in the agricultural world, who has known East Kent for 50 or 60 years. He says:—

> "I should be pleased to give you any information in my power, but I cannot answer one of your 12 questions. We have no custom in East Kent as to farming, and no fixed prices for any labour. For instance the price of cutting wheat last harvest was from 12s. to 35s. per acre. If our labourers can only work half their time the ensuing winter, the prudent ones have saved sufficient to keep them during the winter. Almost all our labour costs us double, and in many instances treble to what it did ten years ago. Neither servants nor labourers seem to care about anything but themselves, and not one farmer in 100 in East Kent can get his work done at a seasonable and proper time. The labour market will ultimately beat us all. I have seen round here one, two, three, and four sacks an acre lost in the stubbles for want of hands. There are hundreds of acres of land around here, which lie as they did after harvest, such as I have not known but once for the last 60 years; and that was in 1816 or 1817. I care nought about a man's capital, it will all go. The farms are all taken as they fall, by bankers, brewers, butchers, chemists, jobbers, grocers, publicans, doctors, drapers, builders, &c. If I occupied a poor-land farm, and was *obliged* to hold it, I would have a sheep-walk, and my son and I would manage it ourselves."

Whatever discount may properly be deducted from this gloomy picture, and, however plain it is that its remedy is to be found in steam-power and reaping-machines and such like, it may in the meantime be quoted as one of many illustrations of the fact that the increase of steam-engines and machines need create no fear for the agricultural labourer.

Here, however, I would say, it is no part of my business to fear or to lament the progress of events, however they may happen to develope. Even if the result should be that agricultural labourers are to form a diminishing class—that at most only one of the labourer's family is trained to take his father's place, it may certainly be doubted whether his lot in future life, or that of his brother who has gone as a carpenter, mechanic, a soldier or a sailor, is to be preferred. The man will do his best to bring up his family for their good and, as he best knows how—and if wages fall, most of them will naturally endeavour to obtain a maintenance in some better way. I confess my belief to be that there are natural safeguards enough in human nature to make the *natural* result within a Christian country, and in a matter so exclusively one of mere maintenance, mere profit and loss, a perfectly safe one, and even a desirable one. Only let the artificial interference between the buyer and the seller be done away with; let knowledge of the state of the market, whether for labour or for its produce, all over the country be general; let the price of agricultural and all other produce be the natural result of simple competition among consumers, and the price of agricultural labour be the natural result of simple competition among employers; let intelligent self-interest—and self-interest in the long run always *is* intelligent—let intelligent self-interest lead to the use of machinery and steam—in fact lead *where it will*—and the greatest happiness of the greatest number will the sooner be attained.

As, however, I have shown, if fears and lamentations have any place at all, it is in behalf of the masters rather than of their men.

One illustration more of the present value of agricultural labour in this country, and on this part of my subject I have done. In the autumn of 1849, just ten years ago, I applied, through the correspondents of a weekly agricultural paper, for information on this subject, and from most of the English counties and many of the Scottish ones I obtained answers to printed questions as to what is the present wage of able-bodied men, what is their weekly wage at harvest-time, what is the ordinary daily wage of women in the field—what is the cost of mowing clover, of mowing meadow grass, of mowing barley, of harvesting a good ordinary crop of wheat—what is the ordinary rent of cottages, and so on. Within the past month I have done the same thing again, and have been told the rate of wages by 93 gentlemen, residing in 12 Scottish and 35 English counties. There is thus the opportunity of making a very fair comparison of wages at a sufficient interval of time.

Let me quote a few instances, taking the weekly wage of an ordinary able-bodied man as the criterion, and, of course, endeavouring to do it without boring you by quotations from so many separate reports.

In Aberdeenshire, Mr. M'Donald, of Huntly, reported the wages of ploughmen in 1849 to be £16 a year, with board and lodging; they are now £22, with board and lodging. Mr. Grigor, of Forres, reported ten years ago the ordinary weekly wages of an able-bodied man to be 9s. to 10s.; now he puts it at 11s. Mr. Bell, of Ferryden Farm, Forfarshire, reported it at 10s.; he puts it now at 12s. in winter, and 15s. in summer. Similarly, Fifeshire wages were 9s. and 10s.; they are now 11s. and 11s. 6d. In East Lothian the wages were worth 10s. a week, or 10s. with coals hauled free; and now they are valued at 12s. to 15s., &c. In Mid Lothian Mr. Melvin reported the annual wages of the married ploughmen at 910lbs. of oatmeal, 12 cwt. of potatoes, two meals daily during harvest-time, the hauling of four tons of coal, and £17 in money; he now reports them at 1,050lbs. of oatmeal, 8 cwt. of potatoes, four weeks of harvest food, coals carted, house-rent free, and £21 in money. Go, now, to the south of Scotland, and in Wigtonshire Mr. Caird reported wages ten years ago at 9s. a week; he puts them now at 12s. A woman's daily wage was 8d., and it is now 10d.

In Northumberland, wages, according to Mr. Grey, of Dilston, were 12s. weekly, with cottage and garden, and carriage of coals free; they now are 15s., with house and garden free; and Mr. Dods, of Hexham, gives to good ordinary labourers 15s. a week in winter, and 18s. a week in summer. Mr. Drewry's wages at Holker, North Lancashire, were 13s. 6d.; they are 15s. to 16s. 6d. Mr. Evans, of Wigan, in South Lancashire, reported wages to be 12s. a week; Mr. Twining, in the same neighbourhood, reports them now at 14s. From Lincolnshire I had four reports of the wages of able-bodied men, and they run thus—10s., 9s. to 10s., 11s. to 12s., and 9s. to 10s. I have four reports from the very same employers now, and they run thus—12s., 12s., 12s., 10s. to 12s.

Mr. Spencer, of Knossington, Leicestershire, told me ten years ago that 8s. to 10s. were the wages of the able-bodied men, and he puts them now at 11s. to 12s. Take, now, the case of Norfolk: Mr. Cubitt, of North Walsham, ten years ago, put the wages at 7s. to 8s., and the carters 1s. to 2s. extra; now it is 9s., and the carters 10s. 6d. In Northamptonshire, Mr. Grey, of Courteen Hall, Northampton, reported 8s. and 9s. as ordinary wages; he puts them now at 12s. weekly.

In Warwickshire, Mr. Burbury, of Kenilworth, who reported 8s. to 9s. weekly in 1849, reports 11s. weekly in 1859.

In Worcestershire, Mr. Hudson, of Pershore, who named 8s. formerly, now says 10s., or 9s. with two quarts of beer a day, are ordinary weekly wages.

In Oxfordshire Mr. Druce, of Eynsham, stated 8s. weekly, the carters and the shepherds having cottages rent-free in addition; wages now are 10s. to 12s., ploughmen and shepherds from 12s. to 14s.

In Wiltshire, the worst paid county in the kingdom, wages were, some ten years ago, 6s. to 7s. for ordinary labourers a-week; they are 8s. a-week at present.

In Kent they were 9s. and 10s., and are now 11s. to 12s.

From Sussex I had three reports formerly, 8s. to 10s., 10s., and 10s.; and I have three reports now, 11s., 11s., and 12s.

From Dorsetshire I had five reports, averaging 7s. and 8s. a-week with cider or beer and with cottage free "in some cases." I have two reports now, the one names 9s., and the other says the payments make the money equal to 12s. weekly.

In Devonshire the wages were 8s. to 10s., and they are 11s. to 12s.

In Cornwall they were 8s. to 9s., and they are 10s. to 12s.

All this proves, then, that the labouring force in agriculture is better paid than it used to be, and that the enormous extension of machinery and of steam-power lately has not been to the injury of the farm labourer.

Although, however, one is naturally glad to know this, yet no one has any right to seek for the labourer any more than that share which falls to him as the natural result of mutual competition. It is for the national interest that food be produced at the least possible expense; and in the second part of my subject, which refers to the most economical provision and maintenance of the forces used in agriculture, the cost of the labour of the farm is as much concerned as is the cost of horses or the cost of steam. It is indeed the first of these to which I most desire to draw attention. The economical application of steam-power, and whether Mr. Fowler's plough, or Mr. Smith's cultivator, or Mr. Halkett's system be the cheaper, will ultimately, by large experience, be determined. Messrs. Howard have, I understand, sold 70 or 80 sets of Smith's apparatus, and Mr. Fowler is so busy that he can hardly keep pace with his orders. Tens of thousands of acres have been this autumn ploughed or worked by steam; and it will be quite within the scope of our subject if the means by which this has been done should be the point on which the subsequent discussion turns. It will also be in keeping with the subject as announced, if the most economical provision and application of horse-powers should engage the principal attention; but of all the forces used in agriculture, that of the labourer himself is the one to which I think we can most usefully confine ourselves.

On the question of efficient steam, agriculturists are willing to accept the judgment of engineers and of the outside public. On the question of efficient horses the public are not likely to add anything to the experience or the judgment of the farmer; the question of efficient labourers is one on which wide differences exist, on which the possession of mere manhood is enough to justify independent thought—on which men of different professions therefore do not feel bound to accept one another's judgment, and on which I believe that the most good is likely to arise from a discussion at a meeting of townsmen with agriculturists. All that I can do in the short remainder of the hour is to indicate the points on which that discussion should turn.

The object is to retain—indeed I now should say to obtain—a sufficient number of well qualified agricultural labourers. The Oxford Farmers' Club met the other day, and Mr. Mein, who is, I believe, agent to the Duke of Marlborough, read a capital paper on this very subject. His method of obtaining more men was none the less sensible for its simplicity; it was just to *offer higher wages*. And this is, I presume, essentially the solution of the difficulty.

He said in effect: We have not provided constant employment nor wages at which a comfortable living can be had, and no wonder that our men have brought up their children to other trades to be better paid; we have not paid young men wages according to their ability; married men have been paid at one rate, and young unmarried men have been paid at another and much lower rate; they have thus been treated as children. But they are not children, and no wonder they have left us. Our remedy is to improve the condition of the labourers in their cottages; to give them more regular employment and better wages (it resolves itself into this, whether a farmer upon four hundred acres had better spend £100 more in labour during the winter or lose £200 at harvest-time in shed and damaged corn); to give the labourers more task-work, and allow them to earn fair prices at it, simply according to their ability; and lastly, on occasions of unusual pressure, to give unusual wages. "Even at harvest, hitherto," he said, "the prices have not been anything to compare to the daily wages of the tradesman; nay, not enough to induce Paddy to join us in this district."

But there are other points besides the amount of wages to be paid. These will indeed increase—not by the exhortations of our public speakers, but by the pressure of competition among masters, and are high or low just according to the relation between the resident-population and the employment for them, so that in Wiltshire they are 8s., while in some parts of the north they are almost twice as much.

But besides the amount of wages there is the mode of payment, which greatly affects the character and position of the labourer. It may be (1), in money solely; it may be (2), partly in board and lodging in the house; it may be (3), partly in money, along with an immense variety of perquisites. These three include, I believe, all the various systems of payment adopted. Of the last I give two instances from the extremes of the island, Forfarshire and Dorsetshire. Mr. Bell, of Ferryden Farm, Forfarshire, writes to me as follows:

> "Our ploughmen receive per annum £17 in money, 6½ bolls oatmeal (14 lbs. a boll—present price 17s. 6d.); 1½ Scotch pint warm milk (3d. a pint), during summer six months, 1 pint in winter ditto; 15 cwt. potatoes, and house and garden, at say £3. This for married ploughmen. Unmarried: £20 and £22, 1 pint warm milk daily all the year, 6½ bolls meal, and fire and lodgings in a bothy. At hay and corn harvest they get two bottles of beer daily, and bread and beer while leading to the stack-yard. Married men get all their fuel driven by their masters."

I value these wages at £34 6s., or 13s. weekly. The daily workers, when getting something like steady work, have 12s. a week in winter, 15s. in summer, with no beer or other allowance.

In Dorsetshire, Mr. Saunders, of Watercomb Farm, Dorchester, writes to me as follows:

> "In answer to your inquiry respecting the wages of the labourers of this part, I will give you an account of what I pay my agricultural labourers of different callings. They all live on the farm near their work, where it is convenient for most of them to go in to dinner every day. I have 18 cottages for which I never receive any rent, as my men all live rent free, and most of them have good gardens besides other potato lands free. It is a very great accommodation to labourers to reside near their work, quite equal to 1s. per week to a man not to have to travel a mile to his work morning and evening, and all have their regular pay wet or dry weather, no loss of time except they are working by piece-work, which most of them get in their turn during the year, when they generally earn from 10s. to 15s. per week, according to circumstances, besides their yearly privileges, which I will state below, and which many of my labourers have said to me at different times 'is nearly half our living,' referring to a cottage and garden, potato land, and the privilege of having grist over that of buying bread of a baker, as I regulate the grist by allowing a peck a head to the family of workers in a house. I think our system is nearly equal to other counties, where they give nearly double the wages, and no house nor other privileges, nor pay for wet days. In this county we agree for a family at a certain sum from the 6th of April to the 6th of April in the following year. Some of my men have continued on my farm with me for more than 30 years without change, where they are good labourers. This, I believe, is about the general run of our county as an average. I will now state how, and in what way I pay my horse-men, as you term them:

	£	s.	d.
House, good garden, worth to let, £4 per year....	4	0	0
Weekly wages 8s., and 30 perch of potato land ploughed in with their potatoes, often growing 15 sacks, now worth 10s. per sack, and allow the seed out, would be £5	25	16	0
200 furze fagots, carried home free to the cottage	1	0	0
28 cwt. of best coals, carried home at 1s. per cwt. and cost to fetch from ship	1	14	0
Extra for harvesting, cash £1, and 1 gallon of ale per day	2	0	0
Every journey with team 1s., average one per week	2	12	0
3 quarts of ale per day at haymaking for 8 weeks, at 9d. per gallon	1	7	0
1 bushel of wheat per week if a family of small children, none to go to work, at 5s., not much advantage now, say 6d. per week, but when dear 3s.	1	5	0
	£39	14	0
The whole of horse-man's wages is about 15s. per week.			
My shepherd has the same as the horse-man, except he earns about £3 extra for sheep which he shears when no pay is taken up from him; and he has 1s. per score for all lambs bred, which, at about 600, is £1 10s.; and also 6d. for every ram let or sold, generally £2 10s. in all	7	0	0
Take from this the difference of carter's journey money, which is	2	12	0
Leaving in favour of shepherd	4	8	0
Wages and perquisites as carter's account	39	14	0
	£44	2	0

> Shepherd's wages weekly 17s., all but 2s. in the year.
>
> Labourer 7s. per week, house as above, garden, potato land in many cases, 200 of furze, 15 cwt. of coals; grist, as I have before stated, at one peck per week for every one who works, great and small, some at 5s. per bushel and some at 6s. per bushel; and most of my labourers have piece-work at different times of the year when convenient. I consider on an average, a good labourer's place with me is full 12s. per week."

This is a most elaborate scheme of payment, and certainly a very liberal one, though I do not value the items so highly as Mr. Saunders does by about £6 a year, making the yearly wage of his ploughman £33 14s., or as nearly as possible 13s. a week. Now, over large districts in England another system obtains, of which Mr. Manser, a tenant farmer at Dumpton, near Ramsgate, gives she following very interesting account:

> "Our ploughmen here are generally single, and yearly servants, and are boarded and lodged by the farmer or by his baitiff. They are hired from the 11th Oct. to the 11th Oct. each year; and though they sometimes continue for several years with the same master, a fresh agreement takes place every year. They commence as lads at 13 or 14 years of age; their duties then are to drive the horses and attend to them in stables, and we also invariably find that the younger these boys go to service (as it is here termed) the better ploughmen and the better labourers they afterwards become. They begin at about £5 wages per annum, which is usually increased every year, as their strength and ability increases, or as master and servant agree; the increase goes on at a ratio of about £1 per year, and our head horse-man or waggoner gets from £12 to £14 per year. The cost of their board varies according to the price of provisions, and when they are boarded by a third party it is generally partly in money and partly in kind; they always have meat three times a day, and cannot be boarded, on an average, at less than 8s. per week per head. In some few instances where there are cottages near, married men are employed as ploughmen at wages of 14s. per week, and a cottage rent-free; if they have to pay rent, they are usually allowed about £5 extra for harvest, in addition to the 14s. per week." He adds—"Our labouers pay about 2s. 6d. per week rent for their cottages, and for this many get but a miserable home. I know of nothing in this neighbourhood so disgraceful as the want of accommodation for our labourers. They are (many of them) driven to reside in the worst parts of the town; many of them in hovels built—or, rather, stuck up—for the purpose of investment, without any regard to health, comfort, cleanliness, or morality. No garden attached, or anything else to make a poor man's home comfortable—completely away from the eye of his master, and all others that feel an interest in his welfare. The consequences I need not describe. With every inducement for him to spend his spare time and his hard earnings at the public-house or beer-shop, often having from two to three miles to go in all weather to his labour, never knowing the luxury of a hot dinner except on a Sunday, or a meal with his family, the children run the streets in the worst parts of the town, and get early imbued in every vice and wickedness. With no father near to instruct or correct them, how can it be otherwise? I do hope this subject will be pressed before the public on every favourable opportunity. I find, on examining my labour account, that my best men, on an average of the year through, earn about 16s. per week, or a little over £40 per year. This includes harvest and haymaking, as well as lost time from weather or other causes, and is the man's earnings independent of the rest of the family."

For all these various customs of payment there must, of course, be the general assent of the labourer, and the concurrence both of master and servant, in order to their establishment and maintenance; and so long as a labourer agrees to take certain wages, there is not the shadow of a plea for interference by any other person between him and his master. The fitness of customs, however, whether in the interests of agriculturists who find that labourers are more difficult to hire, or in the interests of labourers themselves, may very properly be discussed, even by those who have no greater interest in the subject than that which they hold in the well-being of any other class of their fellow-countrymen.

It is plain, on a very short acquaintance with the subject, that every system which has been, and I will say can be, devised, is liable to abuse. And this, moreover, is also true—that each is liable just in proportion to its excellence in the hands of a well-disposed man. The direct payment of a stipulated sum of money for stipulated services to be rendered is, of any plan of wages, the least liable to abuse; but it is, at the same time, that which furnishes the least scope of any for the establishment of friendly relations between masters and men.

Then, on the other hand, that system which gives food and fuel and accommodation is the best of all, when administered with kindness; for the extras are worth to the labourer much more than the sum at which they would be valued to him in a money payment; but there can be no doubt that it is more liable to abuse than the simple money payment. The abuse of the money payment, it is plain, does not affect the relation of labourer and employer at all; it lies in the scope afforded by it for the utter ignoring of the man in any other than this relation. The abuse in the case of payments of food, &c., does affect the due reward of labour; for, notwithstanding the agreement on this score, the quality of all these articles cannot be defined so exactly as their quantity. The payment, too, of all this household stuff as wages is a thing which affects householders only, and the young men who are leaving us are those whom we want to keep. To do so, then, as Mr. Mein, a large employer of agricultural labour tells us, we must just offer wages which will keep them. That is the simple truth.

It is not however the whole truth of the matter. It must be admitted that the relation of master and servant is, by force of circumstances, mixed up in agriculture with much besides a mere bargain for the sale of services, with much that is personal; that there is much more scope for the development of kindly personal feeling between the two than there is in the case of any other class, excepting household servants. Of course this personal feeling may show itself in much that is of great money value besides mere wager, and in much that is of higher value than money is capable of measuring. A young man will, notwithstanding lower wages, keep his place for the sake of advantages of greater value to him than the increased sum he might otherwise receive. He may see that his master takes an interest in him personally, showing it in helping forward his education, and by seeking ultimately a better position for him than he can offer himself, and this is soon observed and thought of. But there is a reverse side to this picture, and just in proportion to the closeness of contact which the terms of service enforce between the two *may be* their recoil asunder as soon as they are once more free.

If there be a plan which would strengthen the bond between the two more than any other, one would imagine it to be the very common one in England of lodging the younger labourers in the farm-house, and giving them partial board as well as cash. But what is the ordinary experience on this point? In the parish in which I reside, Old Michaelmas Day sees a complete sweep of the young men and lads who have lived during the past year in the house of their master. The evening schools each winter present a new array of faces—and the masters are for a while at least, and necessarily, as much strangers to their lads and many of their men as if they paid their wages through a clerk, and had as little opportunity of personal acquaintance as a manufacturer with his hundreds of mechanics.

It is plain that it is not in the *system*, but in the administration of it, that merit and demerit lie, and that, while sufficient wages (that is just as much as labourers can get) are given, a personal interest in the labourer as a neighbour is what will bind him to his master.

If I had in a single sentence to describe the relation of master and servant in the agricultural world, it would be to assert that nowhere is it better and nowhere is it worse. The two are thrown close together, and character is on both sides known, and therein lies the explanation; the two are never—as is unavoidably the case when one man pays 500—they are never indifferent to one another; they love, honour, and respect one another, or they distrust and hate; and while, in the former case, there is a noble scope for exerting a useful influence for their well-being over those who are employed—the latter, in the very closeness which is the condition of agricultural service, has scope enough for bringing forth its fruit.

The combination of sufficient wages, with a greater opportunity for personal good-will than any other trade affords, is what may, and often does, honourably distinguish agricultural labourers and employers amongst the multitude of English occupations.

One further word and I have done. The whole value of the expression to which this good-will leads arises out of its origin in a personal feeling—it cannot be deputed without altogether losing its character. Anything like the transference of my personal duty and pleasure in such a thing to a public society does, in my opinion, spoil the whole affair.

There are societies, as we all know, long established in England for distinguishing the worthy among agricultural labourers by public testimony to their worth. If that worth had shown itself in public-spirited conduct, nothing could be more appropriate than a public acknowledgment of it. When it is, however, only personal and domestic worth (far more worthy, let us all admit it, than the other), nothing can be more grotesquely out of place.

These societies have, however, been established and are supported by a real, if unwise, philanthropy; and I would not say one word in discouragement of their object, however unwise may be their plan. Benevolent men have truly seen that the relationship of master and servant is but a part of the truth affecting them; and carrying the superiority of the employer over his servant into another field where no superiority exists, they have read the commandment as if it were addressed to the former only, and as if it said of the latter: "Thou shalt be a father unto him." The system of rewards for good conduct, for long servitude, and for morality, is founded on a mistaken idea of this kind. It is a mistaken idea—let me repeat it. Along with the paternal relationship, with its powers and responsibilities, wherever it really exists, there has been implanted the natural love of the father as the safe-guard of the child, and the docility and helplessness of the child as its counterpart. Neither of these conditions apply to the relationship of master and servant. The commandment has been mis-read. It is really addressed to both alike, and it prescribes a perfectly mutual and equal duty in words addressed to each—"Thou shalt love thy neighbour as thyself."

This is the law which supplements the bare relationship of master and servant, and makes the operation of it perfect. But I will not pursue the subject further, only adding as at once the natural corollary of this proposition, and as bringing us back more directly to the subject of this paper, that the more we encourage genuine individual manliness in our labourers, with its efforts after real self-improvement, in intelligence and skill, and its higher sense of individual responsibility, the more likely are we to attach the young men to us, and to obtain labour of the kind of which steam-power is rapidly proving the necessity. This is not to be done, either by taking all the difficulties of his position out of his way, or by offering rewards to him proper only to the qualities and condition of a child.

As affecting the reception of these few words of criticism, allow me to say one word of myself: They must not be received as if they came entirely from an outsider. I have for many years directed and paid the labour, on certainly a small farm, costing, however, about £700 a year in wages paid to the agricultural labourer. I claim to know the style and character of the man by many years' experience; for I have a larger number of personal friendships in his class than in any other class of her Majesty's subjects. I mention all this merely as affecting the weight which might attach to what I have said on this—the last of the forces used in agriculture to which I have to allude. I have more than exhausted the time permitted me, and it only remains for me to indicate the probable results, so far as our subject is concerned, of that progress which we all see in English agriculture.

That the services of the labourer will more and more require the combination of skill with mere force, and that a large number of well-qualified men is being and will be needed, seems plain. That horse-power will be displaced by steam at least two-fifths, I believe; and, as there are now at least 800,000 horses used upon our farms, there is scope enough for many years to come for all our agricultural mechanics.

The grand result will, no doubt, be a continual increase of produce and fertility, and that which the Registrar-General puts as a fulfilled prophecy into the mouth of the Englishman of a century ago may with equal probability of truth be uttered now:—

"Our fertile soil sustains 21,000,000 of people in its whole length from the Isle of Wight to the Shetland Islands. We cannot—for the mighty power is not given us—say, let there be on the European shores of the Atlantic Ocean three Great Britains. But the means exist for creating, in less than a hundred years, two more nations, each in number equal to the existing population; and of distributing them over its fields, in cottages, farms, and towns, by the banks of its rivers, and around its immemorial hills: and they will thus be neither separated by longer roads nor wider seas, but continue neighbours, fellow-workers, and countrymen on the old territory; wielding by machines the forces of Nature, that shall serve them with the strength of thousands of horses, on roads and fields and seas—in mines, and manufactories, and ships. Subsistence shall be as abundant as it is now, and luxuries, which are now confined to the few, shall be enjoyed by multitudes, for the wealth of the country—its stock and its produce—shall increase in a faster ratio than the people."

The CHAIRMAN said it was now his duty to invite the meeting to discuss the very able paper they had heard read. It appeared to him that there was very little question that steam-power theoretically was a much more economical power than horse labour, and horse labour, again, more economical than manual labour. But the great problem to be solved in agriculture was, what were the proper proportions in which these three forces should be made use of? There could be little doubt that it would be found eventually that the proportions between those forces found to be most economical, would differ in proportion to the size of the farms, and also the quality of the land. The question whether steam-power would be found most economical upon heavy lands and small farms, or upon light lands and large farms, was one which opened a large topic for discussion, and upon which he was sure many gentlemen present would be anxious to express their opinions.

Professor JOHN WILSON would rather give a different version to the case. He thought they must look upon the man, upon the horse, and upon the steam-engine, not as sources of power, but as the media through which power could be communicated. The real power existed in the material upon which those three forces were fed, and in this respect he thought he could show them that the whole question was one of pounds, shillings, and pence. They knew very well that a steam-engine could not work unless they gave it coals, and a certain amount of water; a horse could not work well unless it was well fed; and a man could not work unless he was properly nourished, because the force existed in the food which these three engines or machines, as they might be called, consumed. They had heard from Mr. Morton of the manner in which these three machines were fed. They knew it was to the interest of those who employed a steam-engine to have an efficient one, and a low-priced engine was a dangerous tool to play with. They knew how proud a man felt of a handsome team of horses, and how well they were fed and attended to. But did they pay that attention to the agaicultural labourer? Was it not the fact that he did not receive the same amount of attention as the other two sources of power mentioned? If therefore the man was to be placed in competition with the machine, he ought to receive the same amount of attention as the machine did; otherwise he was placed at a disadvantage, and he thought it should be the policy of the employer to remunerate the labourer in such a manner as would enable him to get the largest amount of work out of him. He spoke, of course, of physical force—not mental. The mental force required another mode of treatment. The steam-engine could work without horses, but it could not work without the application, not only of a small amount of hand labour, but also of skill. They must, therefore, look upon these three applications of power as the media through which the power was communicated; the real generator of power was the substance supplied; and that was the subject of pounds, shillings, and pence—the real question for farmers to consider, for in that their principal interest was involved. He had heard, with some surprise, the statement as to the condition of the agricultural labourers in Wiltshire. With regard to the north it was the fact that a very numerous body of that class of labourers, though not exactly on strike, were almost in that state, having had several meetings amongst themselves to discuss these matters. He hoped the good sense of the employers of labour there would come to the rescue, and lead them to give proper consideration to some strong points which had been brought before them, though he was no advocate for strikes. In all cases where they set men to hard work—such as that on railways, it had been found that a badly fed man could not exert the power which a well fed man did; and he thought no one could reasonably expect that a labourer at 8s. a week was capable of doing a full amount of work, so as to be fairly placed in comparison with either a well fed horse or a properly supplied steam-engine.

Mr. SMITH (of Woolstone) stated the mode in which he had arrived at some of the returns furnished by him to the author of the paper, so as to explain any apparent discrepancies between his own and the other returns. He bore testimony to the great value of Mr. Morton's paper. According to the estimates given by Mr. Morton, in which he entirely concurred, the saving of steam-power over manual and horse labour amounted to nearly 50 per cent.; and, upon the total number of horses at present employed in agriculture, there would be a saving of 300,000, or equal to £9,000,000 a year, one-half of which would be real gain to the country. If the other half went into the pockets of the labourers in the shape of increased pay, it would be a matter of gratification to him; for he believed the increased production of the soil under steam cultivation would still enable the farmers to secure their profits.

Mr. S. SIDNEY thought that the time had scarcely arrived for working out the Chairman's suggestion, and ascertaining the comparative amounts of hand-labour, horse-labour, and steam-labour that could most profitably be employed on a farm of given quality and acreage. Steam cultivation had, within the last two or three years, been brought to the stage of an economical success; but until Mr. Fowler, Mr. Smith, and others, had fully supplied all the customers who were clamouring for steam cultivators, until it was as easy to obtain a steam cultivator as a set of barn machinery, the calculation suggested by Mr. Lawes could not be made over a sufficiently wide area to give it any practical value. The high importance of Mr. Morton's paper lay in the fact that he had availed himself of his peculiar advantages, as editor of an established agricultural newspaper, to collect precise facts, showing the present state of British agriculture, and specially in reference to the employment of manual-power, horse-power, and steam-power. Thirty years ago the ratepayers of the kingdom were labouring under perpetual fear lest unemployed unskilled labour should devour in poor rates the whole substance of the land, and under the influence of this terror various expedients were proposed, by men eminent for rank, talent, and literary ability, to increase the amount of manual labour. The horse was to be dismissed, as working too much and too cheaply, and we were to retrograde to the spade. This was one of the theories of Robert Southey—cottage farms and spade cultivation—and it was supposed that there was a sort of magical influence in the spade, which would, in some mysterious manner, multiply without measure the fertility of the soil. A great name in political economy, Mr. John Stuart Mill, who, however, had failed totally whenever he approached practical questions of trade, colonization, and agriculture, had suggested pauper colonies in Ireland, where a number of five-acre farms were to be cultivated with borrowed capital, spades, and hoes. These terrors and these fallacies had past away. Mr. Morton had shown, by facts and figures, what everyone familiar with the agricultural condition of the country knew by common report. Instead of being deluged with labour there was a positive drought. Wages were rising, and farmers were consulting and contriving how to attract and retain the class who, thirty years ago, were treated by the poor law and its administrators as if they were some noxious vermin, whose increase was to be obstructed by every possible means. Mr. Morton had shown by figures, which were rather under than over the mark, that while the system of mechanical and intensive cultivation increased the demand for manual labour in those departments where machinery could not be employed had increased also; that wherever a horse could do a man's work, it was more rapid, more effectual, and consequently cheaper; and that wherever steam-power could be applied, it was even cheaper compared with horse-labour than horse-labour was when compared with that of man. It must be observed that economy in agricultural operations meant more produce. The exertions of agricultural engineers had destroyed the fallacy of the spade (most valuable in its place) as a means of raising the sustenance of the nation. He (Mr. Sidney) had made a few calculations, for the purpose of giving some idea of how much was gained by the improvements which had brought mechanical ability of a high order, and the science of the chemist, to assist in the cultivation of English farms of average size and fertility. Mr. Smith's farm at Wolston, in Buckinghamshire, consisted of 110 acres of arable and 70 acres of grass, of good quality. The labour appeared to be performed by seven men and four boys, equal to nine men, the number usually taken to represent in England 45 souls. These men lived, he undertook to say, better than the peasant cultivators of France and Germany. Were this farm divided into six-acre farms, it would probably support double the number of peasant proprietors; it would keep no sheep, a goat or two, no ox-beef, but an occasional supply of the flesh of a worn-out milch cow. There would be, as surplus, a little wheat, rye, and perhaps, flax. The arable would be fallow every third year. But with hand-power, horse, and steam-power, he (Mr. Sidney) would undertake to say that the Woolston farm, being never in naked fallow, produced 6 quarters to the acre, but say 5 quarters on 27 acres, or 135 quarters of wheat, 135 quarters of barley, and with clover and other green crops, roots and beans, at least seven thousand pounds of mutton from 100 sheep, two thousand pounds of pork, from say 10 pigs, and an increase on cattle, purchased or reared, of five thousand pounds of beef; in all, fourteen thousand pounds of meat, besides feeding the family of the farmer himself. These calculations, very much under the mark, would show, not only that full-sized farms were necessary to support agricultural progress, but that it was on large farms, as distinguished from five-acre farms, that the nation must be fed. Mr. Morton's paper had conclusively shown that this progress had been obtained with positive benefits to the labouring classes, who had not been sacrificed, as was once feared, to machinery. He (Mr. Sidney) thought that the distressed classes now were the farmers, hard driven for labour, with high wages and low prices. He believed their only safety and resource lay in adopting steam cultivation, and tempting labourers to stay and increase by improved cottage accommodation. The wages question settled itself, and was beyond the power of laws.

Mr. **Edwin Chadwick**, C.B., had rather expected that the discussion would have turned upon the points which the Chairman had suggested, namely, upon the comparative value of mechanical forces; but he was glad to find that it had been directed to the social and economical effects either already obtained or promised by the introduction of machinery into agriculture. It was most important to discuss the effects of machinery upon the great mass who had to use it —the labourers. In the statistics given by Mr. Morton of the rise of wages, he (Mr. Chadwick) submitted that one large and important fact was omitted. Mr. Morton had stated the progress of wages in different counties, but he had not mentioned another progress, viz., the progress of the efficiency of the labourer; because, according to his own inquiries, the efficiency of the labourer had borne its relation to the improved forces introduced. The farmer in Dorsetshire only paid 8s., and the farmer in Lancashire and some of the northern districts paid 16s. a-week, and the latter got his work done cheaper at the higher wages than it could be done at the lower. Moreover, there was yet room for further improvement by the advance of wages to the operative class. Some time ago there was a notion of getting up a Land Improvement Company, the object of which was to improve particular districts, and to put the land into better condition, by employing a better class of labourers. Those who were engaged in that project were good judges of labour, and they proposed, as the cheapest plan, to employ, not the agricultural labourer of the district, where the law of settlement and low wages prevail, but navvies whose wages were 3s. per day. Truly efficient labour, he submitted, could only be obtained by the advance of wages. The increased development of labour which the improved circumstances of the country would produce, would effect this object. The extensive emigration that annually took place, and the demand for labour in manufactures would raise wages; and he expected and hoped that it would bring this country into the condition of the American labour market, and give an immense stimulus to the introduction of machinery. With respect to what had already been done, he would take the opportunity of congratulating his friend, Mr. Wren Hoskyns, that in the introduction of steam for ploughing, which he had so long laboured for, the corner in the shape of profit over manual labour had been turned. He might mention, by way of contrast, looking to the state of things abroad, that in many parts of the south of France the constant price of ploughing by oxen was at the present time five francs a day for the men and the oxen to do the work, whilst the amount of work done was a quarter of an acre per day. That was paying at the rate of 20 francs per acre, but it was a mere scratching of the surface of the soil some three or four inches deep, whereas steam-ploughing did the work much better at about one-third or one-fourth that price; in other words, the light land which the farmer in France paid 20 francs an acre for ploughing in that way, could be done by the steam-ploughs now in use at 6s. per acre, and instead of being ploughed three or four inches deep, it would be ploughed seven inches deep. The economical, as well as the social part of the question was, he thought, well resolved by a labouring man on one occasion when he (Mr. Chadwick) went to see Mr. Smith's plough at work on the farm of the Prince Consort. Upon his asking the man how those steam-ploughs answered, the reply was that they answered exceedingly well, as he (the labourer) got half-a-crown a day wages. He (Mr. Chadwick) was extremely desirous to see the use of steam culture extended, because he was sure wherever the steam implement went two shillings or half-a-crown wages per day would go with it. But in contemplating the extended introduction of machinery, one important point must be considered, viz., the state of education of the class of agricultural labourers upon whom the management of these new steam implements would devolve. In the larger use of that same power in the manufacturing districts, it was the frequent remark of Mr. Fairbairn upon coroners' inquests, when accidents occurred by the bursting of steam boilers, that for the proper management of the steam-engine a higher degree of education was required than had yet been applied to the labouring classes. If that were so in places where they were paying 20s. or 25s. a-week wages for the management of an engine, what must be the case in the agricultural districts, where the wages are so much lower? It was only by the exercise of intelligence and watchfulness that they could reach the highest order of economy. That had been peculiarly displayed in the case of the Cornish engine, in the use of which men were put upon piece-work, which was not the case in the north. There had been great improvements in the steam-engine in Manchester, but in Cornwall they did as much work with 2½lbs. of coal as was done in Manchester with 10lbs. It was found that farmers were frequently dissatisfied because their engines did not realize all the promises of the manufacturers of them. The answer to that was, that the fault was not with the engine, but with themselves, in not employing more intelligent men to superintend it, and in order to do that they must pay better wages. But unfortunately, in the present state of education in the agricultural districts, if higher wages were offered, the men were not to be found to do the work with the greatest amount of economy; and in order to attain this end, their education must be improved. It was true that prodigious advances in that direction had been made. On going into one of the district schools that day, where a steam-engine was used to prepare the food, he found that boys were placed under the men for the purpose of being educated in working those engines. He thought this was largely an educational question. Besides the employment of machinery, which was so valuable, he thought the small farmers should not attempt a too great use of steam-power, and that there were many useful lessons to be learnt from America, where labour was dear, and also from the continent, where coal was scarce. He would conclude by expressing his high opinion of the remarkably able paper which had been read.

Mr. **Wren Hoskyns** said, if he had wanted evidence of what the general advancement of agriculture in this country had been able to effect, it could not be more satisfactorily furnished than had been done in the eloquent and philosophical paper they had heard that evening. He was struck with the tone of the paper; because, although the subject was a physical one, yet it went also into the metaphysical portion of the question, and all those who read it, whether connected with agriculture or not, could not but consider it as a most useful production, showing that agriculture had made other strides than in matters connected merely with mechanical improvement. With regard to the remarks of the Chairman as to the desirability of establishing something like a specific relation between the forces now employed in agriculture, he (Mr. Hoskyns) had come to the same conclusion as Mr. Sidney, viz., that they had not yet sufficient data for the discussion of that question, because he could not submit to the idea that they had as yet attained to the development of the steam-engine in the cultivation of the soil, which they were destined to witness. Far be it from him to derogate from such splendid specimens of well-applied labour and employment of capital with a courage and determination not surpassed in any department where human ingenuity had been applied, as had already been afforded by the use of the steam-engine in agriculture; but, for specific reasons connected with agriculture itself, he could not believe that the point at which they had now arrived afforded a true test of comparison between the steam-engine and horse and manual labour. One reason why the problem was more difficult, was that the varieties of soil were so much greater than many people were aware of. The difference between the cultivation of light soil and stiff waxy clay was as great as possible, and any conclusion at present arrived at could only be of a very general character. For when they said a steam-engine would plough a shilling per acre cheaper than by the ordinary method, it could only apply to some general average of the soil. But when they saw what horse labour could do upon light soils, where they could cultivate every day in the year, because the labour was less severe, and compared that with soil which did not allow of access to it, except for a month in spring and a couple of months in autumn, the comparison between horse labour and the steam-engine was most difficult. It had been stated by Mr. Mechi that a horse required sixteen hours of rest for eight hours of work. That was understating the case, because a horse required eight months of idleness for four months of work, on a soil which would not admit of the tread of his foot except when sufficiently dry for profitable cultivation to take place. He could not conclude without a word upon the condition of the agricultural labourer, as spoken of by Prof. Wilson. There was, no doubt, much truth in what the Professor had said. A fair estimation of what the labourer was able to do was not possible, because his powers were not entirely brought out—either in a physical or moral point of view. If they had more skilled and intelligent labour, they would have better results from the elements composing it, and especially from that best element of all—the will. He did not know a better foundation for this than a juster distribution of the labourer over the soil, and increased facilities for restoring the due proportion of cottages for the residence of the labourers near their work. Owing to the imperfect laws which had reduced the means of living near their work, it was a fact that labourers did half a soldier's day's work in going to and from the farm. He hoped that residences would be provided for the labourers, in a way that would make them a better investment of capital than they were at present. For some reason or other, which it was difficult to fathom, cottage accommodation could not be provided so as to make it profitable. One of the best inducements to provide this accommodation would be the power of doing so without loss to the landlord.

Mr. **James Howard** (of Bedford) said he subscribed fully to the opinion that the general employment of steam-power in agriculture would tend to increase the employment of labourers. Within his own knowledge, it had in some degree extended the growth of root crops. He could refer to a case in which 35 acres of roots were grown upon land which had never before been so cropped; and if they grew larger root crops, they increased the crops of corn, and increased also the employment of labour. Looking at the increase of population in this country since the extension of steam-power in our manufactories, he was surprised to find that it took upwards of 200 years previously to the introduction of the steam-engine to gain an increase in the population of 200,000,000; whilst since its introduction the population had increased 12,000,000. He thought there were no more effectual means of raising the intelligence of the farm labourer than a more general introduction of steam-power. A farmer who paid a man merely to swing a flail could not afford to pay for intelligence—it was nothing more than the exercise of brute force; but to a man who paid £500 for a steam-engine, a shilling per day additional would be a trifle in the wages of the men employed to direct that machinery.

Mr. Alderman **Mechi** said he felt it nothing less than a duty to pay his tribute of thankfulness and admiration to Mr. Morton for his able paper. He entirely agreed with the tenor of it. He was quite sure that in his calculations of the economy of horse-power over human labour, and of steam over horse-labour, Mr. Morton had not over-stated the case. He (Mr. Mechi) had employed a steam-engine on his farm for the last ten or eleven years, though it was regarded by his neighbours as an act of folly to use a steam-engine upon a farm of 170 acres. His experience during that period had convinced him that the employment of steam-power had not diminished the demand for labour, but had rather increased it, whilst it produced a most beneficial effect upon the profits of the farmer and the intelligence of the labourer. They were all creatures of prejudice; but he had yet to learn that agricultural prejudices were stronger than those of other people, and he hoped that the showing of Mr. Morton that £50 out of £100 could be saved by the substitution of steam-power for horse-labour would tend very largely to remove all prejudice upon that point. With regard to the scarcity of labour, no doubt the cause had been correctly stated by Mr. Chadwick. When they looked at the vast increase that annually took place in the exports and imports of this country, they must see that the mere keeping the accounts, and the handling of the goods about, must absorb an enormous amount of labour. Looking at his own immediate locality, he found that men had been abstracted from agriculture to be employed in the manufacture of implements for foreign exports. He also found that the knowledge that better wages could be obtained in our colonial possessions induced many to emigrate, who had derived considerable advantage from that emigration. Still he thought a good master had not much trouble in getting good labourers. He had employed the same men for many years, and they had become intelligent by the improvements carried out upon the farm. Those men still remained with him, and he had no difficulty in getting-in his harvest at a moderate rate of wages whilst others complained on that score. He agreed with what had been said, that something more ought to be done than the mere payment of wages and the using men as machines which could be laid aside at any time. There was the relation between the employer and the employed to be considered. With a proper regard for that feeling, and by a more general introduction of piecework, which was, after all, the cheapest, he experienced no difficulty in getting and retaining men of great physical and improving mental capacities. With regard to the economy of horse-labour and steam, they must look at it not only in a pecuniary point of view with respect to the direct saving effected, but also to the amount of land that was set free for the production of human food by that substitution, namely, by feeding those 300,000 horses with coal instead of with corn and hay. He calculated that, at the lowest estimate, there would be in the United Kingdom 2,300,000 acres of land set free for feeding human beings instead of animals. That alone was a great desideratum in these times, when population was pressing so hardly upon production. With regard to the various applications of steam-power in the operation of a farm, looking to the improvements they might expect to be made, he saw no reason why, by improved arrangements, in addition to the turnips, &c., being cut up, the food should not be delivered by means of machinery, and why steam should not be made to do nearly everything upon a farm which was now done by manual labour.

Mr. Thomas Scott said it was a gratifying fact which they had heard, that the great pioneers of steam culture — the inventors — had more orders upon their hands than they were able to keep pace with. The whole subject of this evening's discussion had been in fact reduced to the great agricultural question of the day—steam cultivation; and when Mr. Hoskyns said it was judicious to wait a little longer, he (Mr. Scott) would only say that three or four years ago he felt for those great self-sacrificing inventors, but he was happy to add that no such feeling was now called forth. Having noticed the results of steam culture upon the crops, he found that they were such as justified any man in adopting the present machinery, even admitting it to be still far from perfect. A few days ago he entered into an examination of the cost of the operation by Fowler's steam plough, extracted from the carefully kept books of a farm, and he found it to be 4s. 4d. per acre as the actual cost, to which must be made a fair addition for repairs and allowance for wear and tear. If that were the fact, the cost of steam ploughing was very much less than that of the common ploughing, and the produce of the land was greater. It was therefore manifestly to the interest of the cultivators of the soil to abandon the present system, which entailed a daily loss, and to avail themselves of steam machinery, now that the opportunity was afforded them of doing so.

A vote of thanks to Mr. Morton concluded the proceedings.

AGRICULTURAL AND CHEMICAL COLLEGE, KENNINGTON.

LECTURES ON PLANTS

Applied to Useful Purposes throughout the World, or otherwise fulfilling obvious offices in the Economy of Nature, commencing with those which are the Principal Objects of Cultivation, as furnishing Food, Fibre for Manufacture, Medicine, Colouring, Astringent and other Properties applicable to the Arts.

BY CHARLES JOHNSON, PROFESSOR OF BOTANY AT GUY'S HOSPITAL.

Lecture IV.

The epithet, "land-formers," applied to our next group or series of the grass family, may really be understood as having a literal signification. The office fulfilled by most of the species being that of binding loose sand together, and thus rendering it, eventually, a sufficiently undisturbable surface for receiving and retaining the seeds of the more direct colonizers, preparatory to its gradual conversion into pasture-land, they could scarcely be more appropriately designated. Their scene of action is almost universally the low sea-shore; and the circumstances with which they are associated have already been a subject of comment in the course on Physical Geography. Those which relate to the grasses themselves necessarily, however, require repetition here; and with them we must take into consideration some of the leading facts in which their agency and its vast physical importance are alike demonstrated.

The deposit, or rather throwing up, of sand and other debris by the action of the tidal waves, is familiar to all persons who have ever visited such parts of our island coasts as permit of such accumulation taking place. Sometimes this is remarked as occurring at the base of perpendicular or overhanging cliffs, that, originally broken into that form by corresponding action, are thus after the lapse of ages left far inland, the picturesque embellishments of a country no longer maritime rising amidst heath and forest, as they now do in the Weald of Sussex. It is indeed one of the many slow processes by which nature effects the never-ceasing alternation of sea and land; a change most essential to her wide economy, though too tardy in its general progress to challenge man's attention, unless where locally interfering with his own petty plans, or subjecting him to inconvenience in their execution. It is chiefly on low sea-borders that land extension presents itself under such contingences. Here the loose sand accumulates in banks and ridges, ridge beyond ridge successively encroaching upon the dominion of the wave that threw it up, and barring reclamation.

So far the gain is evident, a new estate is being founded, established by the waters; but every wind that blows upon the shore is the agent in another change, and one most disastrous in its unchecked results. The loose summit of the sand-bank is swept inward, its fine particles drifting like a mist over the level, perhaps long-settled and cultivated country, covering the pasture, the garden, and the corn-field, and impairing their fertility. The ultimate design in nature is to elevate the land by these additions to its surface; but to living and toiling man their unrestrained deposit is fearful and paralyzing. To form any adequate idea of the distressing consequences to cultivation produced by this drifting of sea-sand, we must visit districts liable to its inroads, and observe the manner in which it is borne with resistless force inland. Neither wall, nor hedge, nor fence of any kind will stay its progress; it will surmount and even bury all: a forest thick with undergrowth, or a range of hills, are the only successful barriers to its desolating career. On one part of the coast of Norfolk this sand-flood, as it is aptly denominated, is recorded as having advanced over the land of the interior, once fertile and productive, no less than five miles during the past century; and other instances of equal and even greater destruction were mentioned in the lectures to which allusion has been already made, as well as in another course, the details of which are published in the "Farmers' Magazine," see vol. vii., third series, 1855, page 342, et seq. Such sand constitutes the favoured habitat of our land-forming grasses, the destination of which is to fix and fertilize the fleeting masses.

The most useful of these grasses, in this part of the world at least, as being the most generally distributed on the coasts of northern Europe, is the sea-reed. Its botanical name, *Ammophila arundinacea*, literally "sand-loving reed grass," has been altered by some modern writers in this department of natural history to *Psamma arenaria*, both names having reference to its natural propensity for sand, among which alone it is found in a wild state. The change of name, that to the general observer may appear needless, and only calculated to mislead the unscientific student, is in this instance warranted by the circumstance that its first, *Ammophila*, was previously bestowed upon a genus of sand-burrowing insects, and that it is contrary to etiquette among naturalists to confer corresponding generic titles upon two different objects, even when belonging to separate kingdoms. The English name, "sea mat grass," may be all-sufficient for general distinction, but under this the *Psamma* is liable to be confounded with another grass of somewhat similar habit, and by which it is occasionally accompanied, namely, the *Elymus arenarius*, or "sea lyme grass," which is nearly as common, and about equally efficacious in its consolidating functions.

The habit or form of growth of all these sand-binders is so strikingly alike, that in describing one we may picture the whole series. Their principal development is below the surface, where it is continued almost uninterruptedly throughout the year, during nine or ten months at least, with a rapidity truly astonishing to those who observe it for the first time. Early in the spring, and thence until late in the autumn, the long, and for a grass really broad, but always more or less rolled or incurved leaves, are from time to time sent up above the sand, in tufts that sometimes attain the height of two or three feet or more. Such tufts are forerunners of the flowering stems, which, however, are very frequently abortive, and, when developed, the flowers are for the most part barren, that is, do not mature their seeds; circumstances naturally resulting from the wide and constant propagation that is going forward below, and in which the vital energy of the plant is chiefly expended. Corresponding instances of barrenness in the flowers occur in lilies and other bulbous plants, which propagate by offsets at the root, or by the production of buds or bulbils upon the stem.

The tufts of leaves and flower-stems constitute no unimportant feature in the land-forming process: the drifting sand accumulates around them, and thus are formed hillocks or *dunes* that oppose the inundation of the more settled portions of ground behind them, during storms and spring-tides—a catastrophe that would materially interfere with the processes of colonizing and fertilizing.

A remarkable peculiarity is observable in the roots of these grasses: they are generally clothed with woolly or hairy fibres, that enable them to take firmer hold of the loose medium to which their growth is confined than would otherwise be possible.

As the sand becomes fixed, and partly fertilized by the annual growth and decay of these vegetable pioneers, they gradually yield place to others of different character; migrating by pushing out their long subterranean and branching stems constantly in the direction where they meet with least resistance, or toward the looser and more recently deposited sand, which it is necessary to fix in its turn. On the sandy shores of the estuary of the Conwy, in Carnarvonshire, and near the mouth of the Mersey on the Cheshire coast, I have several times traced the running stems of the *Psamma* or mat-grass to the length of twenty or thirty yards, without arriving at their termination. As every joint of these stems, and the joints are seldom more than an inch and a half or two inches apart, is a centre of growth, the enormous extent to which lateral propagation may be thus carried may be easily imagined. The great strength and toughness of this natural cordage at an early period attracted the attention of the poorer inhabitants on some parts of our coasts, by whom they are often manufactured into mats and a coarse kind of ropes; and Withering observes that, in his time, those of Newborough, in Anglesea, derived their chief subsistence from such employment. The land proprietors and others interested in the soil ought, however, to regard its appropriation to any such purposes as associated with danger to the neighbouring country, and discourage it to the utmost of their power.

Cynodon dactylon (the creeping dog-tooth grass) is another sand-binder, whose intricately-branched stems creep above as well as below the surface. This is properly a native of warmer lands than our own, but it has become naturalized on the sea-coasts of Devonshire and Cornwall.

Many other plants besides grasses assist in these fixing and colonizing processes, but the latter almost universally take the lead.

A similar creeping habit to that above described is observable in other grasses, the growth of which contributes in various ways either to the actual formation of land, or to the enhancement of its solidity. Generally considered, these differ much from the preceding in regard to qualities, being less rigid, often highly nutritious, and well liked by cattle when lying within their reach. Such are many species of the order that vegetate in water, or occupying the shallow borders of lakes and rivers. Their influence in these situations is of considerable importance in the broad economy of Nature, though not unfrequently prejudicial to local convenience and necessity in that of man. Among them one of the most immediately valuable is the common reed, *Phragmitis communis* of botanists, a grass of almost universal distribution, especially over the northern hemisphere, within the limits of which it extends, varying in stature only, from the colder and temperate regions to those within the tropics. It may be regarded as the representative of those of its group by means of which some of the most marked physical changes have been effected. The broad foliage, and tall, upright stems, the latter crowned during the summer with large, loose, and gracefully-drooping bunches of purplish-brown flowers, that, eventually, as the seed ripens, resemble tassels of glossy silk, are objects too common to escape notice. This is the largest of the British grasses, attaining the height of six or eight, or sometimes even ten feet, and may occasionally be seen overgrowing extensive tracts, called *reed-ronds* by the inhabitants of the eastern counties of England. Such tracts having been originally pools or lakes, gradually filled up at first by the growth of *confervæ*, mosses, and other plants of low organization, until the water became sufficiently shallow to admit of the reed spreading over the whole, its creeping stems penetrating the soft mud below, as those of the mat-grass do the loose sand. When, after the lapse of a period of years, varying and indefinite, according to circumstances, the bottom becomes consolidated and raised, and evaporation or drainage more rapidly effected; the reeds die, and a vast accumulation of vegetable matter becomes subservient to a growth more valuable: the stagnant pool or unwholesome swamp is ready for the pasture, the corn-field, and the garden.

The extent to which such changes are capable of being induced is not readily appreciable in a cultivated country like our own; but amid the trackless morasses and widely inundated lands in some parts of the world, the offices of the reeds and their brethren are among the most marked sources of superficial change and preparation that our earth is constantly undergoing. They are indeed land-formers and land-fixers and colonizers on a scale as grand and universal as that of the sand-binders.

The reed grasses are little less valuable in the preservation of land than they are in contributing to its formation. We observe them growing abundantly on the borders of rivers, where, while tending to encroach upon the bed of the stream, they at the same time bind its banks with their interlacing creeping stems and roots, and prevent them from being worn away by the action of the water; thus guarding the low lands on either side against the liability to inundation. The banks of the Thames and other English rivers are fortified in this manner, and much of the arable and pasture land, now composing the valleys along which they flow, has been formed by the gradual contraction of their channels through the growth of these grass barriers.

The reed grass is only one among a large number belonging to the grass family concerned in the fulfilment of these important offices, and especially in that of the conversion of water into land. Many species, constituting the principal vegetation of low, moist meadows, occasionally liable to be overflowed by a neighbouring river, or to lie under water in wet seasons or during winter, but in summer yielding valuable pasturage or copious crops of fodder, find their home equally on the immediate borders of streams and lakes. Such are the *Glyceriæ*, or sweet grasses, especially our *Glyceria fluitans*, and *Glyceria aquatica*; the latter a very common grass in the fens or swampy lands of Cambridgeshire and Lincolnshire, where it is said to be sometimes cut for hay three times in one season. It is a plant of much weaker growth and habit than the reed, with more succulent stems and foliage, grateful and nourishing to cattle both in the green and dried states. When it vegetates on the sides of the ditches and pools, these stems spread out and speedily fill up comparatively deep water, and become a formidable evil even in slow rivers, the navigation of which would be soon interrupted unless their increase were checked by artificial means. In the districts above mentioned, the rivers and ditches are frequently cleaned out, and the former are kept open by the use of an instrument termed a *bear*, which is an iron roller with a number of pieces of iron, like small spades, fixed into it; this is drawn up and down the river by horses walking along the bank, and tears up the offending plants by the roots, which thus rise to the surface, and are floated down the stream.

When we reflect upon the vast portions of the earth's surface that have undergone the change from water to land, the valuable ministry of these aquatic grasses in producing such effect becomes evident. De Luc, in the course of his travels in the north of Germany, remarking upon the formation of peat, describes the manner in which the common reed is instrumental in altering the face of the country, as well as the several stages of progress with which its growth is associated, and I quote his observations as accordant with my own elsewhere. In the survey which he made of Brandenburg, Brunswick, and other districts in their vicinity, he found the bottom of every dale a meadow on a subsoil of peat. Many of these meadows had, in the recollection of old people, a pool of water in the middle of them; while in others lakes or pools existed at the time of his visit, the ultimate filling up of which seemed to be insured by the causes in action. The sandy sediment carried into the lake by streams or during rain gradually raises its bottom near the shore; the consequence of this is the growth of the common reed, which advances forward into the shallow water, and leads the van of progress. Tracing from the zone of reeds backward from the clear water, another zone extends of aquatic plants which vegetate nearer the surface, and rise less above it; on the outer part of this, confervas surround the plants like green clouds, and almost conceal the fluid in which they grow. These latter form a bed in which *sphagnum* (bog-moss) vegetates and renders the surface more compact. Beyond, still farther towards the firm land, the *sphagnum* becomes mingled with various marsh plants of the flowering kind, and even some of the meadow grasses that prefer a moist soil: thus commences a zone on which cattle may occasionally pasture during the droughts of summer. A little beyond this the ground becomes more and more solid; hay may be made upon it in the summer months; it is the last stage of progress between the swamp and the meadow, soon destined to become indistinguishable from the latter.

All of these zones are successively changing character as the reeds advance and leave new zones behind them on the places they abandon. The process of land-forming is more or less rapid according to the depth of the water. It is often checked for indefinite periods where the reeds, which cannot advance beyond a certain depth, approach the brow of a steep declivity under water. But in lakes of comparatively small depth and uniform bottom, and in which the sandy or muddy sediments are advancing all around, the reeds, forming a ring gradually contracting in circumference, meet in the centre, and afterwards disappearing, in proportion to the rise of the watery soil in which they vegetate, an uninterrupted expanse of meadow occupies the site of the former lake.

In some meadow land thus circumstanced, attempts have been made, either for ornament or use, to maintain a piece of water; but the attempt is vain, unless supported by continued labour and expense. The reeds and other aquatic grasses, with their equally active coadjutors and successors, soon occupy the space, in obedience to the natural law, for the fulfilment of which they were created.

Such is the process (observes our naturalist, in conclusion) by which, over the immense extent of country he was here examining, lakes and pools are converted successfully into mosses and meadows.

In quoting, I have given you rather the facts and experiences than the language of the author—the general details of that which occurs everywhere under corresponding circumstances, without reference to their local application or their connexion with the subject upon which De Luc himself is treating; and with this, strictly considered, neither extract nor epitome, we will dismiss our examination of the *land-forming* grasses.

GENERAL COMPETITION OF REAPING MACHINES.

[TRANSLATED FROM THE FRENCH OF THE "JOURNAL D'AGRICULTURE PRATIQUE."]

REPORT OF THE JURY OF THE GENERAL COMPETITION OF REAPING MACHINES, HELD ON THE IMPERIAL DOMAIN OF FOUILLEUSE, THE 19TH, 20TH, AND 21ST JULY, 1859.

Circumstances have never been more favourable than this year, for proving the great advantages that agriculture would derive from the employment of good machines for conducting the harvest. All the cereals have arrived at maturity almost simultaneously; and it was three weeks earlier than the average of years that it became necessary to cut the wheat. Work has thus all at once become unusually abundant. Hands, always scarce on the eve of harvest, have been wanting on a great number of farms. Whatever may have been offered in remuneration for hand-labour, the cereals remained uncut long after the proper time for their harvesting, to the injury of both quality and quantity. The great extent of the loss consequently sustained by agriculture, calls for a remedy. The evil, besides, is not purely accidental. The progress of agriculture is such, that hands will in future always fail it, if not everywhere, at least in most districts. The amount of agricultural work demanded of the population has increased simultaneously with the mass of manufacturing work. On the other hand, the cities exercise a fatal attraction over the country workmen: the able-bodied men quit the fields, in order to go and obtain a higher wage, which is very quickly absorbed by the indulgence in expensive enjoyments. Machines worked by animals, water, wind, steam, ought therefore to be henceforth employed in performing the task accomplished by men when their services were less required. Hands become more insufficient in proportion as civilization advances. The genius of man, then, demands of Nature to give it new auxiliaries; and it creates new machines in order to satisfy fresh requirements.

Science is powerful enough now to render any problem easy of solution. We have required of machinery to replace hand-labour in harvest-work. Has not the mechanic discovered the means? This is what it is necessary to decide. For this purpose, M. the Minister of Agriculture, Commerce, and Public Works has determined that a general competition of reaping machine manufacturers should be instituted. The Emperor consented that this competition should take place on the imperial farm of Fouilleuse.

The assurance of protection, encouragement, and high public utility, which presided at the institution of the competition, was comprehended by all, agriculturists as well as machinists. Forty-five machines were entered to take part in the struggle; but only twenty-eight presented themselves upon the ground. Seventeen stood the trial, with varied success; ten were meritorious enough to be rewarded by the jury. At the Universal Exhibition of London, in 1851, three machines only were presented. In 1855 there were only six that would bear the examination; and the same were again shown at the meeting of 1856. Thus, then, in three years, we may notice a considerable increase in the number of inventors of these new implements, who dare to confront public opinion. On the other hand, the agriculturists have hastened from the most distant of our departments, from Algeria, from different parts of England, Scotland, &c., to witness the experiments, at which a considerable affluence of visitors was present. Convinced of the importance of the trials, the agriculturists wished not only to see the machines pointed out to their attention by the jury, but also to acquaint themselves with their mode of operation, before deciding upon what choice to make. Numerous purchases of machines have given a characteristic sanction to the attempt; and we may affirm that no exhibition of reaping machines has yet been so remarkable.

To bring out the proper qualities of the different machines, and to give to the French and foreign inventors equal chances of success, the Minister of Agriculture decided that the machines should be divided into two classes, each to obtain three prizes, besides honourable mentions which the jury considered it ought to award. In addition, a large gold medal was awarded, with the title of honorary prize, to the exhibitor of the machine, whether French or foreign, that should be considered the best in the whole exhibition. In applying this programme, the jury decided that the nationality of the inventor, and not that of the constructor, should constitute the nationality of the machine, on the principle that we ought to regard as foreign machines all those invented by a foreigner, and first experimented on in another country, when even, as now, it should be manufactured in a French workshop.

As it happens with all inventions and discoveries, we can find in history, attempts made at remote periods to execute the harvest with the help of machines. Pliny and Paladius have preserved to us the memorial of cars employed by our ancestors the Greeks, for plucking off the ears, and leaving the straw standing in the fields. It was only at the commencement of this century that the problem has been distinctly proposed by the agriculturists, and taken up by the inventors. In 1799, Boyce patented in England a machine in which sickle-blades, worked by a rotary movement in a horizontal plane were to cut wheat and other cereals. British agriculture had then begun its rapid march forward, and it was hence foreseen what would be the necessities of the future. He felt besides that the rainy climates of Scotland and England required that the harvest should be rapidly secured. The question was broached at many agricultural societies, and put in competition. We saw appear in succession the machines of Plucknet, Gladstone, Salmon, Scott, and lastly Smith, the celebrated agriculturist of Deanston, who received in 1841, from the Society of Dalkeith, a donation of 50 guineas. These machines were composed of circular-saws, large rotary scythes fixed to drums of a conical form suspended from cars which pushed the apparatus. They were far from performing in a satisfactory manner so as to be adopted into practice by the farmer. The inventors also continued to seek for other solutions of the problem. In 1821, Jeremiah Baily, in the county of Chester, in the United States of America; in 1822, Henry Ogles, of Northumberland; in 1825, Brown, of Alnwick, in the same county; in 1828, Patrick Bell, a farmer of the county of Forfar, in Scotland; lastly, in 1832, Joseph Mann, of Cumberland, presented different machines, the better disposed parts of which indicated that they approached the end. Bell's machine obtained, in 1830, a prize of fifty pounds from the Agricultural Society of Scotland. It was placed on the farm of Inch-Michael (in the county of Perth), where from 1832 to 1853 it has not ceased to perform exclusively the reaping, and was also adopted on several farms in Perth and Forfarshire. About 1834, four similar machines were sent to Chicago in the Illinois, a province of the United States, from whence at a later period have been sent to Europe the American machines of M'Cormick and Manny. Patrick Bell had himself been for many years a Protestant minister in Canada, before returning to establish himself at Carmylie in Forfarshire.

In spite of this long and persevering infancy, which may be considered as the sign of a very imperious necessity, the mechanical reapers have but recently become general in Great Britain. The cause is, that Irish labourers come annually in numerous bands to Scotland and England, and thus furnish the farmers an abundant supply of hand-labour at a low price, during the time of wheat harvest. But the Irish emigration, consequent on the cruel famine caused by the potato disease, banished all hope of obtaining in future that supply at a moderate rate; so that about the year 1851, the inventions of the commencement of the century were called to mind, and it was required of America to furnish Europe with the improvements in those machines which she had invented.

The scarceness of hands in the extensive provinces of the United States, the alternative of cutting by expeditious processes, or of abandoning harvest, covering vast plains almost desert, created the necessity of adopting in America very imperfect machines, leaving it to time to render them perfect. From 1831, M'Cormick had held the first patent for a machine, which in 1844 having been considerably improved, was rapidly disseminated. Then commenced an active and effective competition, which successively produced the American machines of Manny, Hussey, Aitkin, Wood, &c. The skill of the English machinists suggested numerous improvements in the primitive machines. The French inventors took up the problem in order to simplify the solution if possible, and furnish our agriculture with machines more in accordance with its constitution.

The reaping machines in their present form are based on one simple principle.

A wheel drawn over the soil by horses, supplies a rolling axle, to which may be applied a resistance equal to the force of traction. Whether that resistance proceeds from a load placed upon a carriage over the wheel, or is produced by a mechanical organ receiving its motion from the same axle, and charged to execute certain operations, the conditions of equilibrium are the same. As we can place only one certain load upon the axletree of a carriage, so we can require of the motive wheel of a reaping machine only a limited amount of work. Let us imagine a toothed-wheel in gear with a pinion placed concentrically with this motive wheel, we should have round the axle of this pinion a horizontal shaft (*arbre de couche*), whence we should obtain by straps and pulleys, toothed-wheels, endless chains, &c., all the movements required, the object of these movements is to cut the crop and bend the corn so as to make it fall on a platform, from which it will be delivered upon the ground in sheaves, or bundles. In the generality of reapers this last operation is not required of the machine itself; but is performen by a workman called "the sheafer." The reaping, which had been attempted to be executed with rotary scythes and sickles, is now performed in all the machines with the help of sickles receiving a rectangular, see-saw movement, very rapid, across large cutting-teeth, which serve both for guides and supports. This system constitutes particularly the invention of M'Cormick: it is drawn laterally by a pair of horses, and is followed by the platform on which the corn falls. The fly-wheel *(volant)*, which bends the stalks of the corn to the scythe, is Bell's invention, and is placed above the saw. Some machinists omit it, and employ the sheafer to perform its functions at the same time that he deposits the corn on the ground.

The Jury not only considered the construction of the machines exhibited, but particularly directed its attention to the work executed by each. For this purpose a field of wheat, containing an area of about 40 acres, had been prepared by M. Lefour, Commissary-General of the meeting, and M. de Corbigny, Inspector of the Crown Forests and Director of the Domaine of Fouilleuse. Forty-three lots, of 18 or 20 ares each (about 2,000 yards), had been measured and numbered beforehand; and the exhibitors were invited to draw by lot those they should reap. The good machines were invited to operate on at least two different parcels. A field of 10 acres had been set apart for the public experiments. In addition, 17 acres of oats were placed at the disposal of the Jury, and the machines were tried upon it. A violent storm, which occurred on the night of the 18-19th of July, had drenched the corn and softened the earth. The sun had afterwards borne great power. The wheat of the Imperial Domaine was very good, yielding by estimation about 28 bushels per acre; some fields might be estimated at 35 bushels; in others a good deal of the grain was shed. The farm of Fouilleuse, containing 76 hectares (or 185 acres), was previously the property of 150 proprietors. This re-construction of the farm, which only took place at the end of 1857, has not allowed time to destroy all the weeds with which some parts were infested. But the weeding, which had preceded the wheat-crop, had already produced a considerable effect.* Lastly: five acres of very poor wheat, not estimated at more than 15 bushels per acre, included in the Domaine, had been hired by the Administration of Agriculture. The circumstances of the work were therefore sufficiently varied, and consequently rendered the decisions of the Jury complete and its judgments perfectly explicit. All these details are necessary to enable the agriculturists to comprehend the care with which the decisions have been arrived at, and the degree of authority they ought to possess.

The machine which appeared to the jury to merit the first rank is that sent by Messrs. Burgess and Key, of London (23, Newgate-street). It is no other than the primitive machine of M'Cormick, perfected by the exhibitors in this respect—that the help of the sheafer is no longer necessary. In proportion as the corn is cut at the foot, it falls, borne by the weight of the ears; and being bent down by the fly, which give it a proper inclination for the cutting, it is immediately taken up by three ranges of parallel screws, which conduct it to the ground: there they turn it over perpendicularly to the road traced by the machine, the ears outward, so as to form a perfectly regular swathe. A moving-wheel, placed so as to support the saws under their separator, detaches itself from this in the rounds, and turns on a pivot in such a manner so as to allow the operation of a disperser (*ecarteur*), and this remarkably facilitates the progress of the machine, which clears, without stop or hesitation, even the right angles. Before the jury, and on many occasions, the machine cut upon a breadth of 1m. 70 (about 5 feet), with an expedition so as to reap more than 60 ares per hour (or nearly 1¾ acres). It is drawn by two horses, and requires only the driver to conduct it. The price in England is 1,062 f. 50 c. (£42 10s.). The work performed was all excellent, and the jury decreed it the first prize in the class of foreign machines, besides the honorary prize.

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* The Jury had carefully inspected, in its most minute details, the Domaine of Fouilleuse. Forcibly struck with the results obtained in so short a time on a tract of land, until now so sub-divided, the members wished, in divesting themselves of their official titles, and considering themselves only in the character of an association of agriculturists, to express their entire satisfaction with a rural model-farm at the very gates of Paris; they therefore requested M. the Minister of Agriculture to award a gold-medal to M. de Corbigny, the Director of the Domaine, and a silver-medal to M. Boudeville, the Farming Steward.

The second prize was awarded—in the same class of foreign machines—to Mr. Cranstoun, of London (11, New Broad-street), for a machine invented by W. A. Wood, Hoosick Falls (State of New York). This machine, drawn by two horses, requires two men—a carman and a sheafer. Its price is 875 f. (£35). It is well-constructed, engages and disengages itself with facility, with the help of a lever raises and depresses the saw, &c. Taking a breadth of 4½ feet, it cut before the jury a surface of 40 ares per hour (nearly 1 acre), leaving a stubble four inches high. In other respects the work was perfectly executed.

The third prize was given to M. Roberts, of Paris (Rue Neuve des Capucines, No. 4), for a machine of the American system of Manny. This machine, priced at 800 f. (£32), employs two horses and two men—a carman and sheafer. With a gauge of 4 feet it cut before the jury 25 ares per hour (about half an acre) only; but its speed would have been greater if there had not been a great number of stoppages, caused by the necessity of turning every instant. The horses went only at the pace of ploughing, and the sheaf was laid in very good order. The stubble was only 3½ inches high, and the work left nothing to be wished for—it is true the machine was managed by two practised hands.

Three years ago M. Durand, farmer and Mayor of Bornel (Oise), finding very great difficulty in procuring hands sufficient to get in his harvest, resolved to purchase a reaping machine, and he selected one of Manny's, which had very well succeeded in the experiments made at Trappes, at the Universal Exposition of 1855. The arrival of the machine at Bornel created a great noise, and a great number of farmers of the country came to see it work. It proceeded badly enough, and it would have been a real misfortune if the machine had been in any other hands than those of M. Durand, for the cause of the reaping machines would have remained lost in that country. Convinced of the possibility of success by the opinion he had formed of it at Trappes, M. Durand resolved to learn how to manage it himself, and ordered his farm-labourer (Louis Joseph Chantepie), who had been sixteen years in his service, to attend to the swathe. This workman caught the idea of his master, and was soon competent to execute the task assigned to him; and he managed to arrange the machine in a manner to render the work less fatiguing; whilst by other modifications which he suggested, it was more perfectly performed. Success crowned the efforts of these two intelligent men—the farmer and carman. The neighbouring agriculturists were invited to have their incredulity conquered, and changed into complete belief in the future use of reaping machines. Since that time M. Durand has made three harvests, with a considerable saving of hand-labour and money, and at the most favourable time, without having recourse to strange hands on his farm.

Wishing to reward such an example, set by a master and workman, and to testify how honourable it is for a simple farm servant to seek the means of employing usefully a new machine, instead of crying it down on account of the difficulties it presents to those who do not know it, the jury requested M. the Minister of Agriculture to grant a silver medal to M. Durand, and a silver medal and 100 francs to Louis Joseph Chantepie.

The class of foreign machines included several others worthy of notice, and to which honourable mention have been awarded.

M. Laurent, of Paris (28, Rue de Chateau d'Eu,) exhibited a machine, price 850 francs (£34), constructed on the model of the McCormick machine, before the improvements recently made in it. Drawn by two horses, and employing two men, this machine reaped before the jury 50 ares per hour (nearly 1¼ acre) cutting a breadth of 1m. 30 (or nearly 4ft. 6 in.) The first honourable mention was granted to it.

Two other honourable mentions were awarded. The first to Messrs. Clubb and Smith, of Paris, (9 Rue de Fenelon): the second to M. Ganneron, of Paris (56, Quai de Billy), for two machines, constructed on the principle of Hussey, of Baltimore (United States). These machines, priced at 650 francs (£26), performed the cutting well before the jury. They were managed by two horses and two men, the first cutting 35 ares per hour (or nearly 1 acre), the second 30 ares (about ¾ acre), both taking a gauge of 4f. 3in.; they have both the defect of laying the swathe by means of a see-saw platform, behind the machine, upon the very path the horses must take in making a new turn. It thus requires to have five workmen attached to the machine, to clear away the sheaves, and prepare the passage for the horses. It may be said, undoubtedly, that this labour is not lost, since it is necessary in all such cases to collect and form the sheaves before tying them; but it is not less certain that the additional hands are required instantly, at the moment in fact of cutting the corn, and consequently the problem of separating hand labour from machinery, leaving the men disposable for other work more pressing, is not resolved. We grant the utility of Hussey's machine, and even the success which it meets with in certain operations, but it does not effect everything that we have a right to demand of a reaping machine.

The jury regretted that the machine exhibited by Mr. James Suttie, of Inchture, county of Perth, Scotland, was not put together in a manner so as to do its work properly. This machine, invented by Lord Kinnaird, is a combination of the McCormick and Bell systems. It lays the corn in very regular swathes, and is deserving of attention.

The class of French machines was less numerous than that of foreign; but it was equally deserving of close examination. An essential difference must be made between the two sorts of machines. Whilst the American, English, and Scotch machines occupy much room, requiring very wide roads and gateways for their passage, and consist of a complication of accessory movements, the French inventors have directed their attention to put together machines in a small compass, to contract and confine the several parts. They have fitted them to go in foot-paths, and pass through narrow openings. On the other hand, they aim at making one horse and one man suffice for working it. The foreign inventors appear to have made their machines for large farms, whilst the French machinists have had a special regard to the small-farm system.

In the first rank of French machines the jury has placed that of M. Mazier, of Laigle (Orne), and decreed him the first prize. This machine costs 1,050 fr.

(£42). Managed with one horse and two men, it reaped, before the Jury, at the rate of 25 ares per hour (about 3-5ths of an acre), taking a width of 3ft. 6in. The work was well done, and the swathe was laid by a man furnished with a rake for bending the corn to the machine, and depositing it, when cut, beyond the platform, there being no fly. The saw has the advantage of being made to turn upon the central axle of the movement, so as to be let down on the right or left, at pleasure. In this way they can cut either way, and the wheat beaten down does not escape the action of the machine. The turning of the machine is effected in a very few moments, and two or three minutes also suffices to unmount and fold up the machine. The construction is ingenious and well conceived. This invention dates from 1853, and M. Mazier has sold a great number of his machines in France, Algeria, and even in foreign countries.

The machine by M. Lallier, of Venizel (Aisne), performed its work as well as that of M. Mazier. It costs only 700 fr. (£28). It is also very simple, occupies little space, and folds up into a small compass. It is furnished with a fly, acting in such a manner that the sheafer has only to lay the cut corn upon the ground. Managed with two horses and two men it reaped at the rate of 27 ares per hour (2-3rds of an acre), with a gauge of 3 ft. 6 in. Although of too recent invention to have, at present, the sanction of practice, it appeared to the jury deserving of the second prize.

The low price of a machine, combined with ample solidity, certainly constitutes a valuable qualification. M. Legendre, of St. Jean d'Angily (Charente Inferieure), has exhibited a small machine of his own invention, costing only 350 fr. (£14), which cut well at the rate of 23 ares per hour (rather more than ½ an acre), taking a breadth of 39 inches. It was worked by one horse and two men. If this machine is sufficiently strong not to require frequent repairs, it is certainly destined to render important services. The jury awarded it the third prize.

M. Cournier, of Saint Romans (Isère), proposed a difficult problem—that of constructing a machine which shall require only one horse and one driver, who shall work the machine and dispose of the reaped corn. He has partly succeeded, and has already placed in his own and the neighbouring departments several machines, which have performed at the harvest-work successfully; but we fear it will be subject to frequent derangements. It has cut at the rate of 30 ares per hour (about ¾ of an acre), taking a width of 39 inches, and costs 750 fr. (£30). The jury decreed M. Cournier an honourable mention.

Many machines, and particularly those exhibited by Cranston and Roberts, have the advantage of being eassly converted into mowers. This is noted by the jury, and it examined, with great interest, a particular mower, brought by Messrs. Burgess and Key, which cut a field of lucerne with complete success. The rapid mowing of natural or artificial pastures with the help of machines is an attainment of the first importance, which requires to be investigated with as much attention as that of reaping-machines. All mowers ought to be tried comparatively upon meadows, lucerne, tares, &c.; and agriculture would owe a new and great debt of gratitude to the Government if such an experiment were permitted. The jury also expressed a wish that the Minister of Agriculture would consent to arrange, at an early period, a general gathering of mowing and haymaking machines, and all others intended for rendering the hay harvest more expeditious.

Such has been the meeting at Fouilleuse, and the result certainly proves that agriculture has obtained machines which will henceforth render the harvest independent of a scarcity of hands, and of the vicissitudes of seasons. The announcement of a result so important has not been made by the jury alone, a great number of agriculturists having come from all parts, of their own accord, to verify the facts stated in this report.

The jury had made up the list of prizes when the Emperor unexpectedly arrived upon the ground, and asked to see the prized machines perform; expressing a wish afterwards to distribute himself to the exhibitors the rewards they had won. The presence of the Sovereign, who had just only returned from the sanguinary fields of battle in Lombardy, in that pacific arena of agriculture, triumphant also over a long and serious difficulty, gave an important sanction to the results of the exhibition. Bearing in mind the desperate struggle sustained a few days before by the heroic soldiers of France, agriculture saw with pride the illustrious chief, who had conducted the army to victory, come to encourage, in their turn, the labourers of the field, and applaud their success.

The Minister of Agriculture, Commerce, and Public Works, accompanied by the Director of Agriculture, wished to follow up a part of the operations of the jury, and to give an account of the results obtained.

The Minister of Algeria, a country where machinery has so important a part to play, has also examined with care the novel invention, which is called to take an elevated rank in an age already illustrious from the invention of railways and the electric telegraph.

The general consequence of the introduction of reaping machines in rural labours will be very important. These machines will enable the farmer to cut the corn at the most favourable moment, to leave it less time exposed to the intemperance of weather and to gather it in quickly. They supply therefore the means of drawing all the possible share of fruits from the earth, which often holds out hopes unexpectedly blighted; for the farmer can only reckon on a harvest when it is under shelter in the rick-yard, the barn, or the granary. They will emancipate the cultivators from the casualties of mowers, and leave almost all the hands disposable for the sole operations of putting the corn into sheaves, tying, and loading them on the waggons. At the same time, it will save about 40 per cent. of the expense of an entire harvest, making two horses supply the place of twelve or fourteen men. This is precisely the result that the Academy of Sciences established the truth of, at the end of the seventeeth century, on comparing the labour of men of average strength with that of horses. We may conclude that in their present state the reaping machines make a useful employment of the mechanical application of the power that conducts it.

Will the reaping machines clear the ridges, the slopes, the stony grounds? Can they be adopted on the patchwork agriculture of many parts of France? We already perceive that many of them have saws that are raised and modified so easily as to clear every obstacle that presents itself, so that nothing is insurmountable. We can easily conceive that one single machine in the hands of a contractor can undertake to reap the harvest of a great number of small occupiers. In fact we can foresee that in order to use the harvesters to the best advantage the farmers will be induced to contrive means to do away with the ridges, to clear his fields of stones, to clean the soil, to level the surface, and keep in repair the farm roads. Such results will follow the adoption of reaping machines, and will make them a blessing. Besides, as all progress is linked together, the mechanical reapers will deliver the field labourers from a severe task, usually accomplished under a burning sun, under circumstances the most unfavourable to health. Every truly good discovery is in harmony with the law of charity, and raises man to a better condition.

General Allard, President of the Jury.

J. A. Barral and Eugene Tisserand, Reporters.

HOW TO MAKE MONEY BY FARMING.

There is nothing better than a good title. It backs a man in society, puts up the biddings for a property, sells a book, attracts the sight-seer, and is half the battle with the popular print the artist so prides himself on. Within only the last year or two a sagacious American felt the full force of this, and wrote a work right up to the most telling title he could think of. He did not call it "a Love Story," or "a Mission to the Mormons," or "Aunt Sally's Cottage," or plagiarise in any way upon precedent. On the contrary, he struck out a line of his own, and advertised five hundred different plans for making a fortune. In what edition the volume may be at this moment, it is not within our province to say; but it should surely be better known in Paternoster-row than even Adam Bede, Dr. Livingstone's Travel, or Dr. Cumming's Tribulation. Still there may be some who have actually not yet heard of these acceptable recipes, and we are not quite certain that making a fortune by farming was one of the five hundred points included in the category. If not, it should have been. There is nothing more simple, and day by day we have hints and offers of how it is to be done. You have only to catch your hare—or, in other words, to get a farm—and there are plenty of people ready to show you how to cook it.

At the close of another year, with moist weather for thrashing and low markets for selling, there could scarcely be a more welcome topic. The prudent farmer is balancing his accounts, and scratching his head, and trying to see how he stands. The prospect is not, perhaps, altogether as clear as it might be. But he has heard so much of this kind of thing before, that he would most probably put down our Yankee authority as a bit of a humbug, and not read the book if we gave it him. Still the notion is too good a one to be thrown away; and so, when the Halesworth Farmers' Club ask Mr. Bond to oblige them with a paper, that gentleman boldly selects these very colours to sail under. Mr. Bond is now deservedly a man of some repute; and everybody knows when he is announced, as he so frequently is, for another lecture, there will be something in it. As a consequence the Halesworth Club was more than usually strong in the selection it made. The title was doubly a good one. It embraced the name of a good man, coupled with a most enticing thesis, "Agricultural Money Making." If all Suffolk was not there to see, they can have little to complain of hereafter.

It is not our purpose to follow Mr. Bond through an address which we give in full. But at such a season it may be by no means out of place to devote some consideration to Agricultural Money Making. Until a man has fairly tried it, there is not one in a thousand but knows this is to be done. If an amateur, or only half-educated to the business, the greater proportionately will be his confidence; and one good year will serve as the example for twenty bad ones. Be, however, this as it may, whether money is still made by agriculture or not, we certainly now essay the attempt in quite an altered fashion to that of our forefathers. The well-to-do farmer of half a century since was a very different person to the dashing experimentalist of the present era. His golden rule was to stay at home and mind his business, and he more often than not yet further extended the precept by holding his tongue. He had something more than a disinclination to change of any sort, and the improvements he did effect, in the character of the cultivation or the breeding of his beasts, were all made on the principle of slow and sure. He lived hard, and perhaps, after all, his secret of making money was saving it shilling by shilling, and not being "put up" very often by his landlord or the agent. In fact, it was another of his wise saws not to have much of a show about the place, and whether his guineas went into the stocking, or were entrusted with some more profitable investment, it was hard to say if his wealth should be counted in hundreds or thousands, or what "fortune" he could really leave his favourite daughter.

The modern man who tries his hand at agricultural money making is quite of another school. He makes it his business to see something of the world. He prides himself on the appearance of his homestead, and is always having somebody coming to see it; while if he gets into a good strain of stock, he publishes the fact all the world over. His landlord is specially invited to see the sheep, let at fifty pounds a-piece, or Shorthorns knocked down at their hundreds a lot. He has plenty to say for himself, lives like a gentleman, and lays out his money freely in anything that promises well. He is ever ready for real improvement, and is a certain customer for high-priced manures, and first-class machinery. In a word, his education, his principles, and his practice are diametrically opposed to those of his grandfather; while the world at large is quite willing to allow he is the superior man of the two. Undoubtedly he has attained to the ostensible object of increasing the productive powers of the soil, and hence, at the first superficial glance, he should surely be making a better thing of it. But this is clearly a debatable point. But in agricultural money-making the farmer, despite his science and his machinery, and his improved system, has now many difficulties to contend against, that his ancestors had little experience of. With war prices, low rents, and the rest of the nation with plenty to do without troubling themselves much about the pursuits of agriculture, money-making might have been comparatively an easy trade. They let the farmer alone in those days; while now, on the contrary, everybody is at him. They urge him to progress; and when he has obeyed this command, and done his best, round comes the sharp agent or busy landlord to compliment him with a rise in proportion to the improved value of the farm. If he demurs to this, Mr. Smelt, the rich fishmonger from Oxford-street, is positively rampant for the offer, on any terms; or the county banker wants the place almost as much for his second son; and one man comes down by the early train, and half-a-dozen by the next, "having heard you were about to give it up." The first great essential of modern farming is capital; and as indispensable an item in making money at it must be security for that capital. Mr. Bond rightly respects a good landlord, whose very character may be hereditary; but he points in a more business-like manner to the uses of a lease, or we may go on to add, some well-drawn compensation covenants. Everything no longer depends on the wheat crop. Even with a full one the market may make it hardly worth selling; and if the producer does put it to home consumption, he should have the chance of another turn in some other way. Capital will aid him here; but without a well-assured position, it will be more luck than anything else, if he has time to tack and reef as the wind shifts to another quarter.

The look-out a-head would seem to threaten some such a change in the weather. Agricultural Money-Making has a rather different reading to that it had some little time since. We are not now to depend so much on a fine sample and so many quarters. The recipe is more one of beef, mutton, and wool—getting the best stock, and doing the best by it—returning attention to grass-lands and grass-seeds—in fact, going with the times, and supplying what promises to pay best. There would, moreover, appear to be no other country able to oppose us in this branch of trade. Foreign beasts will not do, or, under almost any circumstances, no one can turn an animal to so generally good account as the English grazier. He has, indeed, a certain pride in the art. Others, with large tracts of country, may vie with us in growing bread-corn, but "beef, mutton, and wool" would seem to be the chorus of a song that—as with "God save the Queen" and "Rule Britannia"—no one can take up like a British yeoman.

HALESWORTH FARMERS' CLUB.

The following is the lecture delivered by Mr. Robert Bond, of Ipswich, at the meeting of the Halesworth Farmers' Club, on the 7th December, 1859 :—

At discussions or intended discussions at meetings of this character, it is a matter of common complaint that the introducer too often takes so wide a field, and makes so clear a sweep of the entire subject, at the same time entering so fully into detail, that nothing of importance is left for the members generally to discuss. Now, gentlemen, this is an error into which I can assure you I shall not fall upon the present occasion. It is even a matter of regret with myself that my time has been so fully occupied that I have been unable to devote to so important a subject that thought and consideration which it deserves and requires. Fortunately it is a subject upon which every gentleman present has had some experience, or upon which he has made some observation, and I trust our individual opinions combined will form a correct basis upon which to construct first principles.

It may have been the opinion of some gentlemen present that it was my intention, in my presumption, to endeavour to teach my seniors in age and my superiors in experience the intricate art of agricultural money-making; believe me I never entertained such a thought. I have no panacea to advance for the cure of the present pecuniary agricultural atrophy, nor have I any high road to wealth to offer for the enlightenment of the most unsuccessful.

I believe such is the emulation and stimulant to advancement in life, that, speaking in the main, each man will exert every energy, strain every nerve, engross every thought, plot, contrive, and plan, as far as lies within his knowledge, means, and ability, to attain that one object—success in life; that success is best secured by such individual effort, varying according to varying circumstances, and the infinite variety of agricultural positions, rather than by any general law or universal principle. I think this is a subject likely to lead to misconception, at first sight, as to the probable method of its treatment. It in reality embraces the entire amount of profit realized from the soil without any division of that amount into the various shares realized by the respective partners concerned, viz, the landlord, tenant, and labourer. I think it may not be undesirable to consider the division of that sum total of profit into the relative shares, after treating upon the entire subject generally.

Agricultural money-making, then, embraces the entire pecuniary amount of profit realized from the soil, whether as rent to the landlord, or as profit to the tenant. Let it be remembered that rent, properly considered, is that share of the amount of profit derived from the soil which, after the exercise of the utmost skill and the necessary capital on the part of the tenant, he can, in the average of years, afford to pay to the landlord as per-centage for the use of the land, first deducting therefrom that just amount as remuneration for time and skill which is the tenant's due. Thus rent is, to a certain extent, a portion of the profits, and although from the want of necessary information it is impossible to draw up an agricultural balance sheet of the expenses and returns of the entire agricultural kingdom, and arrive at the balance of profits, yet this subject opens up a wide field for comparison and inference, both continentally and relatively as to our own agricultural progress. What, then, is England's position comparatively with continental nations? I am so imbued with the opinion that complaint and fault-finding nationally are the sure incentives to improvement and increased exertion, that I generally consider it desirable to endeavour to discover our weak points (and they are many), and to condemn them in detail; but when I look at our position as a whole, I cannot repress my national pride at our agricultural prowess, for a combination of British skill, capital, and industry has made England not simply the garden of the world comparatively, and the admiration of the civilized world, but it has made it that favoured spot which yields the largest monetary agricultural return, area for area, of any land in the known globe. 'Tis not that its soil surpasses, in natural fertility, the virgin soils of other lands; 'tis not that its climate is more genial; but whilst Russia and Poland are, comparatively, uncultivated; Italy and Spain, with their agriculture receding, instead of advancing; France, as computed, producing but 14 bushels of wheat to the acre, America 15, Holland 23, Great Britain produces even 28 and upwards. Yet it is not in her wheat produce alone that England so far excels any other country; it is in the meat produce of her agriculture that she more especially transcends—a produce which has been cultured not to perfection, but to a degree which no other nation has yet aspired to approach to as a rival, and to a standard which no other people can pretend to attain to for many a long year. What are the sheep of other lands when compared? and even what their beast? Those reared by English hands are noted for their size and symmetry, for their aptitude to fatten, and their early maturity. Take the Smithfield Christmas Show of the present hour. I yesterday saw different specimens there of beasts, not three years old, weighing upwards of 100 stone of 14lbs., and of sheep, but 20 months old, weighing from 10 to 12 stone of 14lbs. This is an indication of what we have attained to, whilst the beast and sheep of other countries, speaking generally, are miserably deficient in the quality of their meat, and lacking almost every attribute which contributes to that desirable end—remunerative return for produce consumed. Every land combined could not produce such shows of cattle as England now annually exhibits, whilst the acreage average meat produce of England far exceeds the meat production of even the most favoured spots, and spots, too, far surpassing England in the natural advantages of soil and climate.

It is computed that France is not so advanced in her animal productions as Great Britain in 1700—more than a century and a half since; and we believe England produces in value millions of pounds sterling more meat than any other country, or portion of a country, taking area for area.

France, with an area exceeding England by more than one-third, produces a gross annual value of sixty-four million pounds sterling, whilst the annual meat produce of Great Britain is computed at no less than eighty millions of pounds sterling. Thus, with 35 per cent. less acreage, Great Britain surpasses France even 20 per cent. in the annual value of her animal productions.

France keeps but one sheep to 4½ acres, one beast to 13 acres, and Great Britain one sheep to 2½ acres, and one beast to 9¼ acres; and the British beast and sheep, it must be remembered, double in weight those of France, to say nothing of the great superiority in the quality of their meat.

It was the opinion of the late Sir Robert Peel that upon removing the import duty from live-stock, the lean animals of other countries would be freely purchased and readily fattened in this country; but those who have had any experience in grazing foreign animals, whether beast or sheep, are well aware that neither early maturity nor aptitude to fatten were features in the undertaking, and the transaction probably proved the reverse of agricultural money-making. I have said much in praise of the agriculture of England, and with all her agricultural faults she richly deserves it; yet, when we see the demand—the immense demand which has recently sprung up, as if by magic, for agricultural machinery upon the continent generally, and the immense importations which are now taking place of machinery from England, it well becomes us, as an agricultural people, to devote our energies to the carrying out, individually, every desirable established improvement which tends to lessen the cost of production or to increase the return; and, further, to exert our ingenuity and assiduity to surpass our previous successes, or, with the improved machinery and the important strides which other agricultural and continental nations are trying to make, we may find we are ultimately surpassed, and thereby lose that agricultural pre eminence which has hitherto been our legitimate pride and our monetary advantage.

What is England's agricultural position at the present time, when compared with her own history, especially of half a century since, and what her comparative agricultural produce and consequent agricultural money making? We have the record that in 1387, on the Manor Farm of Hawstead, in Suffolk, 66 acres of wheat produced 69 quarters of grain, and 26 acres of barley yielded 52 quarters 2 bushels, thus producing about one quarter of wheat to the acre, and two quarters of barley.

In the time of the Stuarts, about 1688, the wheat produced in England did not exceed 2,000,000 quarters, whilst in 1859 the wheat produce of the kingdom is computed at upwards of 14,000,000 quarters, and upwards of 30,000,000 quarters of grain generally. But to descend to a more recent comparison, embracing the last fifty years, I find the select committee of the House of Commons, which sat in 1813, to enquire into the state of the corn trade, reported, that through the extension of and improvement in cultivation, the agricultural produce of the kingdom had been increased one-fourth during the ten years preceding the time of their enquiry.

In 1821, Mr. Wakefield computed the average produce of all the wheat lands in England at no more than seventeen bushels per acre. In 1840, Mr. M'Culloch was of opinion that the produce of the wheat lands of England had been raised to an average of twenty-six bushels; whilst at the present moment such has been the rapid improvement in the science of agriculture and in the cultivation of the soil, that the average produce of wheat through England has amounted to upwards of twenty-eight bushels, showing an increase of between seventy and eighty per cent. within the present century.

If such has been the increase in wheat produce, the yield in other grain has equally increased, whilst meat in the same time has, I believe, been doubled in produce—even increased 100 per cent. I have no doubt but the gentlemen present can in recollection trace that progress, commencing from the introduction of turnip husbandry, which has been increasing and extending till even the clay lands of England now produce a heavy weight of roots, especially mangold wurtzel, and each clay farm now yields an annual return in meat produce. Not only has the land been made to produce roots wherewith to manufacture meat, and not only have improved methods of rearing and fattening animals been adopted, but the animals themselves have been so vastly improved in quality by judicious crossing and care in breeding, that the fattening process, which was usually a work of some three, four, or five years, is now effected in half that time, and the average weight of the animals killed has increased one-third. I believe, therefore, that comparing 1800 with 1859, from thirty to forty millions more in money value of meat are now annually produced, and considering that the population of England has doubled within that period, such a result as doubling the meat produce of the kingdom is most salutary. Now, why is it that England has surpassed continental nations agriculturally, and why has England's agriculture been so rapidly developed to its present proportions?

Undoubtedly her extensive manufactures and commerce, the increase of her wealth and population have been of signal service, in creating a home demand for every luxury, and every necessary which the soil has produced; but even such a demand, and all the skill, industry, and capital which England has so successfully invested in the cultivation of the soil, would have been powerless and unemployed but for the good understanding which has existed between landlord and tenant, either legally or from a high sense of honour, and thereby giving security to investment, and assuring to the tenant the full participation in the profits resulting from his exertion and improvements. I, of course, speak but generally, as I can see much that is glaringly defective—much that I desire to see amended, as a mutual and national advantage in that relationship; but progress in agriculture has depended, and does depend, not simply upon the means, the skill, or the capital, but upon the motives which impel men to put forth their resources; and tenants, from prudential reasons, will not invest, if under the conviction that they may sow improvements and another reap the fruits of their toil and outlay. What has made France so inferior in her agricultural position—in her agricultural money-making? Independently of continually parcelling and dividing the land into small holdings, it has been the abominable system practised of letting to metayers, or a class of tenants which have usually paid to their landlord a third or a half of their produce. Such a system has offered no inducement or incentive to exertion and outlay, and the result has been a tenantry retained in beggary by exaction, and unexcited to effort by any hope of reward or of rising in the scale of society to a position of competency and comparative comfort.

Italy has been similarly situated with France, and her agricultural resources are equally undeveloped.

Seeing, then, how vast the monetary increase in corn and meat from the soil of England, within the last half-century, amounting to upwards of 70 per cent. of the former, and 100 per cent. of the latter, the question naturally arises, "Who has been the great gainer, the landlord, tenant, or labourer?" We may conclude that we have not lived the last fifty years to arrive at the fact that we cannot produce a coomb of wheat or a pound of meat as cheaply as our great grandfathers. The truth is, even with the increased capital required, we can and do produce our crops at a far cheaper rate. Why, in 1815, the remunerative price for wheat was 80s. per quarter; in 1827 Mr. Canning estimated it at 65s. per quarter; and in 1842 Sir R. Peel at 56s.; whilst for the last 15 years the average price has been 54s. per quarter. Again, the price of wheat for the 10 years ending,

1805 was	...	...	81s. 10½d.
1815	...	...	97s. 6d.
1825	...	...	78s. 8d.
1835	...	...	56s. 7d.
1845	...	...	57s. 11d.
1855	...	...	53s. 10¾d.

—Thus, with a gradual depreciation in the value of produce, it is perfectly clear the agriculturists of England have produced corn and meat at a far cheaper rate by the aid of an improved and extended system of draining and stock farming—by the investment of more capital—by improved manures, improved machinery, and increased skill; and, at the same time, the rental value of land, which must be considered an indication of profits, has risen coincident with a fall in the price of produce. Thus the gross rental of land by property-tax returns was,

In 1815	...	...	£32,502,000
1842	...	...	37,794,000

which, at the same rate of increase, gives the property-tax for 1859, in round numbers, £41,000,000, thus showing an increase, in less than half a century, of £9,000,000 sterling in rental. I know well that many enclosures have taken place within that period; but such a source of increase of rental is but a minor consideration, less than £1,000,000 compared with the increase resulting from general improvement. And that improvement must be indeed vast which has been able to stand against prices, as far as wheat is concerned, reduced in value 33 per cent., and rent increased 28 per cent.

It is quite clear, then, that in the matter of agricultural money-making, the landed proprietors of England have been the great gainers. They have most justly, most legitimately, and most fairly reaped the larger share of that increased produce, which has resulted from vast and progressive improvements. Competition must always effect this result. Landed proprietors invested wisely, and they have reaped, and will deservedly reap, the benefit arising from agricultural progression. I would appeal to your own experience whether rents within the last fifty years have not greatly risen? That investment in land, which but half a century since paid but 3½ per cent. on the outlay, in many cases now pays 6 or 7 per cent.; and I believe such will be the result in the future. I firmly believe that such will be the agricultural advancement and progression in improved mechanical appliances, deeper culture, extended stock farming, and increased usefulness of produce, that much land now purchased to pay 3½ per cent. will fifty years hence almost double its rental return. It is quite a mistake to say that land pays the worst per-centage of any investment. I know this is a common remark, and it is perfectly true upon a recent purchase; but it must be remembered that every purchaser of agricultural land purchases at the same time the advantages which will in the future result from invention and improvement in the cheapening the cost of production, or increasing the returns from land, that is as far as the area of his purchase is concerned. And if you trace the history of many an estate in England, owned by the same family for centuries, and making all due allowance for the alteration in the value of money, you will find in different instances that the return is now upwards of 20 per cent. upon the original and actual investment, inclusive of any after-outlay on the part of the landlord for improvements. Why, within the last half-century, the Earl of Leicester's well-managed property has increased in rental nearly 50 per cent.; and there are instances in Suffolk in which farms have increased in rental value within the same period 100 per cent. This is but a sign of advancement, and it is certainly a proof that the great increase in agricultural money-making has ultimately and mainly found its way to the pocket of the landlord. I repeat this is perfectly just, and if any tenant dislikes the natural result of the force of circumstances, he had better curtail his occupation, and become an owner as well as an occupier. But what is the position of the tenant relative to agricultural money-making? Nearly sixty years ago, Burke, in his work, "Thoughts on the present Scarcity," said, "The majority of farmers do little more than subsist." It must be remembered that at that time farms were generally small, and I believe such a description is equally true of the small farmers of the present day. With all the agricultural improvements of the past half-century, not forgetting the improvements in the intelligence and standing of tenants generally, the increased size of farms, and the greatly-increased capital now employed, tenants have not increased their per-centage returns upon investments, and that per-centage in the average of years has been low. I am not surprised at this when I consider the tenant's position. England's increase in population and wealth, probably to the amount of 100 per cent. within the past half-century has not only created an increased demand for the produce of the soil, but it has also created an increased demand for the occupation of the soil itself. With a gradual diminution in the value of wheat 33 per cent., and a rise in the rental value of land 28 per cent., with no considerable increase in the amount of cultivated land, but a considerably-increased demand for farms, the tenant has been in no easy position; he must have improved his holding and advanced with the advancement of the age, or he would literally have quickly lost not only his per-centage return, but his capital also. It is quite clear that the great increase of the wealth and population of the kingdom has been most advantageous to the agriculture of England; but, at the same time, the greatly-increased competition for farms cannot be advantageous to the profits of the tenantry of the kingdom; and I believe the increased competition of the present day arises from increased population and increased wealth. It is the natural result of supply and demand; the latter exceeds the former; and whilst the real agricultural tenant farms for profit, there are many retiring upon the profits of manufactures and trade, or living upon the per-centage from trade, who engage in agriculture not for profit, but pleasure. I know it may be said this occurs only in the neighbourhood of towns; but let it be remembered that towns in England exist in every locality, and such competition, regardless of profit, increases the difficulty of per-centage returns to the tenantry at heavy odds. Around Ipswich and other towns to my knowledge there are several gentlemen connected with manufactures, trade, or professions, who farm simply for pleasure and not for profit. By all means let it be so; no one can justly complain of the fact; but it deserves the attention and consideration of those who farm for a livelihood. A gentleman very extensively engaged in manufactures, at a public meeting at Ipswich, the other day, gave it as his experience upon agricultural profits, that if other persons' farming returns agreed with his own, it was an evil that would soon work its own cure. I had the curiosity, only last week, to speak to a gentleman engaged in agriculture, and largely connected with manufactures, upon agricultural profits. He distinctly said, "I do not expect either profit or per-centage returns; and if I do not lose money, I shall consider myself fortunate." This, gentlemen, is the competition which tends to reduce the tenant's profits below par, and of course but a few thousand farms throughout the kingdom, thus occupied as pleasure farms, considerably increases the competition amongst farmers for the remainder. Again, the farmer who farms regardless of profit, quickly, in the matter of giving the greatest rent, beats the farmer who farms for a livelihood out of the field. For different advertised farms recently, in different cases, there have been fifty applications, and such competition will probably not allow much profit to the hirer. When the mercantile principle of letting to the highest bidder is pursued under yearly tenancy and restricted covenants, the tenant's profits are reduced to the lowest minimum. I know there are gentlemen who question these facts—facts, indeed, which are too self-evident to admit of argument to any extent, and who further assert that the money return made by farming is equal to that made by manufactures or trade from the same amount of capital. Within the last half century, manufacturers and traders generally have amassed fortunes, and I say unhesitatingly that trade, and farming as a tenant upon a competitive rental, are two very different things. The competition in trade is actually less; and the per-centage in profit is infinitely more. Though I hear much on the superior pleasures of farming, I have seen enough of agricultural unsuccess to have arrived at the conclusion that the counting-house or the counter, with success (with the possession or the prospect of a snug villa in the country), is infinitely superior to the questionable pleasures of farming with unsuccess; for though a man may breathe the fresh air, ride round his farm, and eat the pure viands of country life, yet he may do all this with no joyous heart; and I have seen enough of the stagnation of position and the fruitless struggles for advancement, to advise my young uninitiated agricultural friends (with but small means) to hesitate before they embrace a calling which, with the extreme competition of the present day, must allow of but small profit, and certainly not quick returns. Many a farmer who is now making a good profit has to thank his landlord for a large proportion of that profit, simply because his farm is liberally let at a moderate rental, and not thrown into the market. With unlimited competition for farms, and with lettings by the year, or for short periods, to the highest bidder, whatever the average price of produce, I assert, unhesitatingly, that the profits must average at a very low rate to the occupier. I speak of it as a principle which must operate under such circumstances. I know well enough trade is not all sunshine, but that there is as hard a battle for existence in some instances—yes, and similar unsuccesses and failures in trade—as in farming; but I speak in the main and generally, and the difference is in extent. I know well enough that chance tenants share largely in the profits of agricultural money-making, gain a good percentage, and accumulate property; but such cases are quite the exception; and, again, when compared with trade, the difference is in extent. It may be supposed I fear competition—such is not my feeling. Competition for farms with long leases and liberal covenants will give the triumph to capital, and capital agriculture still requires. With such a basis of agreement as lettings for long periods, or with security to investment with liberal covenants, time and opportunity are allowed for the investment of capital, and the exercise of skill in progressive and permanent improvements, whereby the tenant reaps his reward; but yearly tenancies, without mutual confidence and without any allowance for unexhausted improvements, prevent the outlay of capital, cause stagnation, and extreme competition in such cases has ruined many a man. Though the competition to which I have alluded, causing the victory to capital in the contest for farms, will be most beneficial for the advancement of agriculture, yet I believe the tenants of the present day with small means will eventually be beaten out of the market; they have gradually been falling away for years past, and their places will in the future be filled by men with capital derived from other sources. Competition, hereafter, will still be fierce between capital and skill at home for farms; and with the whole world to sell in our market, 'twill be fierce there for prices. Although there is room for considerable advancement, and improvement in increased production by the exercise of skill and capital combined, yet I do not anticipate that the tenant's share of agricultural money-making in the future will be any greater than it has hitherto been. Competition for farms will keep down percentage returns, and where profits beyond a low average are made, it will be where farms are not offered for fierce competition in the market, or where very unusual skill is displayed by the tenant.

In agriculture every operation is so open that no amount of skill is long concealed; by imitation it quickly becomes general property. The largest profits have been made from good lands, because they have been comparatively more cheaply rented, considering quality; and the largest returns have resulted from a medium system of good management, and avoiding either extremes. Stock farms of late years, with the high price of meat, have been by far the most desirable occupations.

In the greatly increased returns derived from the soil, how has the labourer fared? What has been his good fortune, and his proportion of the profits? We must admit that from 9s. to 12s. per week, as in this district, is not an extreme rate of payment; but it is a matter for congratulation that the law of supply and demand, as relating to the labour market, has within the last few years operated to the labourer's advantage, and there is now no need for a labourer to go the round of his parish asking for labour, and ultimately finding a temporary asylum in the union-house, because of the want of employment. A good man is now actually sought after, and the prices of harvest-work and task-work have risen, whereby the labourer's position is decidedly improved. I must admit that his gain in the increased agricultural returns of the present time are indeed small, and his pecuniary position is but slightly improved; yet, notwithstanding, he stands infinitely better in the social scale as a more free and independent man; and if the labourer will but use his improved position aright—I long to see him able to command a better home, a better education, and more of the physical and intellectual comforts of existence—I fully believe such a future is opening for the labouring man, and he will participate more fully than heretofore in the advantages of Agricultural Money Making. So late as the reign of James the First, a man was accounted a serf; and previous to that period the most exacting laws were passed, compelling him to work from five o'clock in the morning till between seven and eight o'clock in the evening, at a very low scale of wages—at a penny or twopence per day; but, with the increase of England's agricultural produce, the labourer's position has gradually improved. Old notions are giving way, and Christian feeling so far begins to prevail practically and truly, that an honest man with true nobility of feeling, of bearing, and of character, though he has not a pound in his pocket, is as much esteemed—ah! and more than he who has thousands without that worth which money cannot purchase, and without which the millionaire goes down to his grave pitied by some, scorned by others, and quickly forgotten by all.

I would make this one observation by way of digression;—Highly as I prize the present Poor Law, yet it cannot culture provident and self-reliant habits; and I believe an exalting auxiliary might be established upon the principle of a life insurance, whereby, by a monthly payment, every member after 60 or 65 years of should be entitled to a proportionate monthly out-door money allowance; and such an institution, supported by suitable funds in addition to the monthly payments of its members, would exalt the labourer in feeling, and produce in him prudent and self-reliant habits, which would free him from the prospect of the workhouse as his ulterior home, and assist many a man to rise in the scale of society.

I would now cursorily glance at the changes which would have a tendency to increase the amount of profit derived from the soil, but I shall confine myself to a very few remarks upon the currency laws, the free transfer of land, the abolition of the malt tax, the relationship of landlord and tenant, and improved farming.

I do not pretend to a full understanding of the currency laws which the legislature of the kingdom has thought proper to enact, but I am aware, as many are painfully aware from a bitter experience, that we have frightful monetary panics occurring at intervals, and it is perfectly clear to me that if the currency laws have the effect of heightening the value of money, such increase, beyond its natural value, is most detrimental to the producing interests, as it has the direct effect of causing produce to be sold below its natural value in the market and increases the cost of production. I can fully understand the reasonableness of the suggestions made by our friend Mr. Haward, who has so ably advocated currency reform, and this portion of the subject I gladly leave in his hands.

I am convinced the free transfer of land will act most beneficially in lessening the system of mortgage, and nominal ownership, in increasing the number of wealthy owners, and by assisting to create outlay in modern improvement, such as the erection of the necessary buildings and the like.

I view the malt tax as decidedly detrimental to agricultural money making, not simply from the fact that it tends to deteriorate the value of barley by lowering the price, but by checking its consumption and by rendering the ordinary qualities of barley unavailable and unconvertible to malt for the labourer, or for feeding or fattening purposes for cattle. I will forbear entering into the injustice of this tax, as your rules would forbid such a treatment of the subject.

Great as would be the benefit resulting from these changes, the abolition of the malt tax and the free transfer of land, yet I view them as insignificant when compared with the consequences which would result from a full and extended adjustment of the relationship between landlord and tenant. When I view the history of an estate, a county, or a country, I can plainly see that that relationship is the fundamental basis of agricultural success or failure, of progress or stagnation. French agriculture is an instance of stagnation, for even Monsieur Trehonnais admits that, with all the advancement of that intelligent people, her agriculture for the past 300 years has even retrograded, and France is the living representative of a landed proprietary impoverished by their own exaction, and of a tenantry fettered to poverty and debarred from progress by their ruthless position. With rents extreme, covenants absurd, and tenure insecure, they are fettered by rapacity, routine, and poverty to the past, and barricaded from advancement. England (speaking generally) is the living exponent of that correct feeling of reciprocity between landlord and tenant, which I believe has been the corner stone of England's agricultural success. I admire the glorious feeling of mutual confidence which has subsisted especially upon such estates as the Earls of Yarborough and Leicester, and no estates and no tenantry have more signally flourished. Although England's agriculture has prospered so well in the past, yet I can plainly see that the full development of her agriculture depends upon the full development of liberality of sentiment on the part of the landlord. Liberal and good farming will follow upon liberal and wise conditions, and before improvements can be general and permanent in the yet backward spots, the tenure must be secure or the investment safe, and the skill of the tenant must be unfettered by clauses which tend to prevent outlay and improvement in the soil rather than to guard the landlord from injury or exaction I believe England's agriculture in the future is quite capable of continuous and vast improvements; even now we know of much plough land and pasture but half farmed, whilst I am convinced there is much waste land, with the increased demand, capable of reclamation and profitable culture. I think there is no question as to the course we must pursue at the present time, with present prospects and present prices. Beef, mutton, wool, barley, and all the comparative luxuries of life, must have our especial attention. Even the imports themselves point to this result, for the imports of grain of every description have increased 160 per cent. since 1846, whilst the number of animals imported have not increased since the first importation after the removal of the tariff dues. I am convinced the more stock that is reared upon any description of farm, upon the legitimate principles of correct breeding and prudent fattening, the greater will be the Agricultural Money Making throughout the kingdom at large, and the greater the profit to the tenant and landlord.

To recapitulate briefly, I have shown how greatly the agriculture of England surpasses that of France, or any other country, in its corn and meat produce. I have shown that England has almost doubled its yield of grain and animal food within the past half century. I have pointed out that by a gradual depreciation in the price of wheat 33 per cent., and an increase of rental 28 per cent., food for the million is produced at a much cheaper rate than heretofore. I have remarked that the increase in rental to the amount of 9,000,000 pounds sterling makes it perfectly clear that the landlord has been the great gainer in agricultural progress, whilst the extreme competition for land has prevented an increase in the per centage return to the tenant. I have explained the extreme competition for farms of the present day, upon the fact that farming is a pleasureable occupation, especially to those who can afford to disregard profits; and that the increased wealth and population of the kingdom, without any increase in area, have caused the demand for land to exceed the supply. I have pointed out the fact that the labourers' position has improved with the increase of agricultural produce, and that at the present time his prospects are still improving. I have expressed my opinion that certain alterations and amendments would assist still further to increase the return in produce, and, in consequence, agricultural money making; and that the agriculture of England will yet become even more great, more glorious, and more free.

Mr. Bond having concluded his remarks, an animated discussion ensued, in which the Chairman (Mr. Robert Haward), Mr. C. Haward, Mr. R. Tacon, Mr. F. B. Strathern, and others took part; and after a vote of thanks to Mr. Bond for his able lecture, the meeting separated.

THE GREAT TILE-DRAINER.

HIS HISTORY—HIS FARM—HIS PRACTICE—AND HIS FEEDING.

Mr. John Johnston, near Geneva, N. Y., at one time esteemed a fanatic by his neighbours, has come of late years to be generally known as "the father of tile-drainage in America." After thirty years of precept and twenty-two of example, he has the satisfaction of seeing his favourite theory fully accepted, and to some extent practically applied throughout the country. Not without labour, however, nor without much scepticism, ridicule, and controversy has this end been attained; and if, now that his head is whitened, and his course all but run, he finds himself respected and appealed to by persons in every State of the Union, he does not forget that it has been through much tribulation that he has worked out this exceeding great weight of glory. Mr. Johnston is a Scotchman, who came to this country thirty-nine years ago, and purchased the farm he now occupies on the easterly shore of Seneca Lake, a short distance from Geneva. With the pertinacity of his nation he stayed where he first settled, through ill fortune and prosperity, wisely concluding that by always bettering his farm he would better himself, and make more money in the long run than he could by shifting uneasily from place to place in search of sudden wealth. He was poor enough at the commencement; but what did that matter to a frugal, industrious man, willing to live within his means and work hard to increase them? And so with unflagging zeal he has gone on from that day to this.

HIS FARM.

His first purchase was 112 acres of land, well situated, but said to be the poorest in the county. He knew better than that, however; for although the previous tenant had all but starved upon it, and the neighbours told him such would be his own fate, he had seen poorer land forced to yield large crops in the old country, and so he concluded to try the chances for life or death. The soil was a heavy gravelly clay, with a tenacious clay subsoil, a perfectly tight reservoir for water, cold, hard-baked, and cropped down to about the last gasp. The magician commenced his work. He found in the barn-yard a great pile of manure, the accumulations of years, well rotted, black as ink, and "as mellow as an ash-heap." This he put on as much land as possible, at the rate of *seventy-five loads to the acre,* ploughed it in deeply, sowed his grain, cleaned out the weeds as well as he could, and the land on which he was to starve gave him about twenty-five bushels of wheat per acre. The result was, as usual, attributed to luck, and anything but the real cause. To turn over such deep furrows was sheer folly, and such heavy dressings of manure would not fail to destroy the seed. But it didn't; and let our farmers remember that it never will; and if they wish to get rich, let them cut out this article, read it often, and follow the example of our fanatical Scotch friend.

This system of deep ploughing and heavy manuring wrought its results in due time. Paying off his debt, putting up buildings, and purchasing stock each year to fatten and sell, Mr. Johnston after seventeen years of hard work at last found himself ready to incur a new debt, and to commence laying tile-drains. Of the benefits to be derived from drainage he had long been aware; for he recollected that when he was only ten years of age, his grandfather, a thrifty farmer in the Lothians, seeing the good effects of some stone drains laid down upon his place, had said: "Varily, I believe the whole airth should be drained." This quaint saying, which needs but little qualification, made a lasting impression on the mind of the boy, that was to be tested by the man, to the permanent benefit of this country.

Without sufficient means himself, he applied for a loan to the Bank in Geneva; and the President, knowing his integrity and industry, granted his request. In 1835 tiles were not made in this country, so Mr. Johnston imported some as samples; and a quantity of the "horse-shoe" pattern were made in 1838, at Waterloo. There was no machine for producing them; so they were made by hand, and moulded over a stick. This slow and laborious process brought their cost to 24 d. per thousand, but even at this enormous price Mr. Johnston determined to use them. His ditches were opened, and his tile laid; and then what sport for the neighbours! They poked fun at the deluded man; they came and counselled with him, all the while watching his bright eye and intelligent face for signs of lunacy; they went by wagging their heads, and saying "Aha!" and one and all said he was a most consummate ass to put crockery under ground, and bury his money so fruitlessly. Poor Mr. Johnston! He says he really felt ashamed of himself for trying the new plan; and when people riding past the house would shout at him, and make contemptuous signs, he was sore-hearted and almost ready to conceal his crime. BUT WHAT WAS THE RESULT? Why this: that land which previously was sodden with water, and utterly unfruitful, in one season was covered with luxuriant crops, and the jeering sceptics were utterly confounded; that in two crops all his outlay for tiles and labour was repaid, and he could start afresh and drain more land; that the profit was so manifest as to induce him to extend his operations each succeeding year, and go on until 1856, when his labour was finished, after having laid 210,000 tiles, or more than fifty miles in length! And the fame of this individual success going forth, one and another duplicated his experiment, and were rewarded according to their deserts.

It was not long after the manufacture of the first lot of tile that a machine was contrived which would make them quite as well, and faster; and by its aid they were afforded at quite as low a price as after an English machine was imported. The horse-shoe tile has been used by Mr. Johnston almost exclusively, for the reason that they were the only kind to be procured at first, and on his hard subsoil, finding them to do as well as he could wish, he has not cared to make new experiments. He has drains that have been in function for more than twenty years without needing repair, and are apparently as efficient now as they were when first laid. In soft land pipe or sole tiles would be preferable, or if horse-shoe were used they should be placed on strips of rough board, to prevent their sinking into the trench-bottom, or being thrown out of the regular fall by being undermined by the running water. He has not used the plow for opening his trenches for the reason that all his work has been let out by contract, and the men have opened them by the spade; charging from 12½ to 15 cents per rod for opening and making the bottom ready for the tile. The laying and filling was done by the owner.

HIS PRACTICE.

His ditches are dug only two and a half feet deep, and thirteen inches wide at the top, sloping inward to the bottom, where they are just wide enough to take the tile. One main drain in which are placed two four-inch tiles set eight inches apart, with an arch piece of tile having a nine inch span set on top of them, was dug three and a half and four feet deep, and this serves as a conduit for the water from a large system of laterals. Drains should never be left open in winter, for the dirt dislodged by frequent frosts so fills the bottom that it will cost five or six cents per rod to clear them; and, moreover, the banks often become so crumbled away that the ditch cannot be straddled by a team of horses, and thus most of the filling must be done by hand. Mr. Johnston in draining a field commences at the foot of each ditch and works up to the head. He opens his mains first, and then the lateral or small drains, but he lays the tiles in the laterals and fills them completely before laying the pipe in the mains. The object of this is to prevent the accumulation of sediment in the mains, which would naturally be washed from the laterals on their first being laid. By commencing at the foot of each ditch and working upward, he can always get and preserve the regular fall, which may be dictated by the features of his field, more easily than by working toward the outlet. A little practice teaches the ditchers how to preserve the grade almost as well as if gauges were employed; but before laying the tiles the instrument is applied to test the bottom thoroughly. The necessity of this precaution will be apparent to any one who reflects that if a tile or two in the course of a ditch be set much too high or too low at either end, the water quickly forms a basin beneath and around, sediment is washed into the adjoining pipe, and ultimately even the whole bore is filled and the drain stopped. When this happens it will be indicated after a time by the water appearing at the surface of the ground above the spot—drawn upward by capillary attraction. In such a case the ditch must be reopened, and the tile relaid.

ILLUSTRATIONS.

Mr. Johnston says tile-draining pays for itself in two seasons, sometimes in one. Thus, in 1847 he bought a piece of ten acres to get an outlet for his drains. It was a perfect that it would not give back the seed sown upon it. In 1848 quagmire, covered with coarse aquatic grasses, and so unfruitful a crop of corn was taken from it, which was measured and found to be *eighty bushels* per acre; and as—because of the Irish famine—corn was worth 1 dol. per bushel that year, this crop paid not only all the expense of drainage, but the first cost of the land as well.

Another piece of twenty acres, adjoining the farm of the late John Delafield, was wet, and would never bring more than ten bushels of corn per acre. This was drained at a great cost—nearly 30 dols. per acre. The first crop after this was 83 bushels and some odd pounds per acre. It was weighed and measured by Mr. Delafield, and the County Society awarded a premium to Mr. Johnston. Eight acres and some rods of this land at one side averaged 94 bushels, or the trifling increase of 81 bushels per acre over what it would bear before those insignificant clay tiles were buried in the ground. But this increase of crop is not the only profit of drainage; for Mr. Johnston says that on drained land one-half the usual quantity of manure suffices to give maximum crops. It is not difficult to find a reason for this. When the soil is sodden with water, air cannot enter to any extent; and hence oxygen cannot eat off the surfaces of soil-particles and prepared food for plants: thus the plant must in great measure depend on the manure for sustenance, and of course the more this is the case, the more manure must be applied to get good crops. This is one reason, but there are others which we might adduce if one good one were not sufficient.

Mr. Johnston says he never made money until he drained, and so convinced is he of the benefits accruing from the practice that he would not hesitate—as he did not when the result was much more uncertain than at present—to borrow money to drain. Drains well-laid endure; but unless a farmer intends doing the job well he had best leave it alone and grow poor, and move out West, and all that sort of thing. Occupiers of apparently dry land are not safe in concluding that they need not go to the expense of draining, for if they will but dig a three-foot ditch in even the dryest soil, water will be found in the bottom at the end of eight hours, and if it does come, then draining will pay for itself speedily. For instance, Mr. Johnston had a lot of thirteen acres on the shore of the lake, where the bank at the foot of the lot was perpendicular to the depth of thirty or forty feet. He supposed from this fact, and because the surface seemed very dry, that he had no need to drain it. But somehow he lost his crops continually, and as he had put them in as well as he knew how, he naturally concluded that he must lay some tile. So he engaged an Irishman to open a ditch, with a proviso that if water should come into it in eight hours, he would drain the entire piece. The top soil was so hard and dry as to need an application of the pick, but at the depth of a foot it was found to be so wet and soft that a spade could easily be sunk to the entire depth of the handle. The ditches were made, and in less than the specified time a brave lot of water flowed in. The piece was thoroughly drained, and the result was an immense crop of corn. The field has regularly borne sixty to seventy bushels since. Corn was planted for a first crop in this and the preceding instances because a paying crop is obtained in one year, whereas if wheat were sown it would be necessary to wait two seasons. He always drains when the field is in grass, if possible, for the ditches can be made more easily; and spring is chosen that the labour may not be interfered with by frosts.

To show how necessary it is to avoid planting trees over drains, we quote a case in point. In a lot adjoining his house are four large elms which are marked to be felled, and for the reason that the lot was formerly so wet that a pond of water stood upon it in winter, and throughout the season the children skated and slid upon it. It was drained, and all went well for a time; but after three years Mr. Johnston found his drains did not discharge properly, and that in certain places the water came to the surface, so as to destroy or greatly lessen the crop above them. He could not account for the circumstance until he dug down to the drain at each of these spots, when, to his surprise, he found the tile completely choked with the fibrous roots of the elms, which, naturally seeking the subterranean supply of water, had so accumulated in mass as to stop a two-inch bore of tile.

Mr. Johnston does not think there are a hundred acres in any neighbourhood that do not need draining, and would not pay well for it. Perhaps this may be thought an extreme assertion, but it is nearer the fact than most of us have been aware. Mr. Johnston is no rich man who has carried a favourite hobby without regard to cost or profit. He is a hard-working Scotch farmer, who commenced a poor man, borrowed money to drain his land, has gradually extended his operations, and is now reaping the benefits, in having crops of forty bushels of wheat to the acre. He is a grey-haired Nestor, who, after accumulating the experience of a long life, is now, at seventy-five years of age, written to by strangers in every State of the Union for information, not only in drainage matters, but all cognate branches of farming. He sits in his homestead a veritable Humboldt in his way, dispensing information cheerfully through our agricultural papers, and to private correspondents, of whom he has recorded one hundred and sixty-four who applied to him last year. His opinions are, therefore, worth more than those of a host of theoretical men, who write without practice. He says that the retrogression of our agriculture in the olden States is to be accounted for in our lack of drainage, poor feeding of stock, which results in giving a small quantity of poor manure, and in not keeping enough to make manure. He applies 100 loads of manure to the acre at the beginning of a rotation, and this lasts throughout the course. He learned from his grandfather that no farmer could afford to keep any animal that did not improve on his hands, and that as soon as it was in good marketable condition it should be sold and replaced by another. This theory he has always carried out, and, as natural consequence, has always got higher prices for his beef stock, and a ready market, even in the dullest times.

CROPS.

Although his farm is mainly devoted to wheat, yet a considerable area of meadow and some pasture has been retained. He now owns about 300 acres of land. The yield of wheat has been 40 bushels this year; and in former seasons, when his neighbours were reaping 8, 10, or 15 bushels, he has had 30 and 40. We are informed by him that there has been no such crop as the present since 1845, either in yield or quality; and the absence of weevil is remarkable. A variety of white wheat from Missouri, sown more thinly than usual, has yielded 31 bushels to something less than one bushel of seed sown. It headed out a fortnight earlier than the Soule's but ripened later, probably because thinly sown. Mr. Johnston thinks we have been sowing too thickly for fifteen years past upon rich land, and there can be no question but that he is right. Still it is better to take a medium course between thick and thin sowing, and thus avoid, on the one hand, rust, overcrowding, and waste of seed, and, on the other, placing an entire crop at the mercy of insects which may attack it.

SALT FOR RUST.

As a sure preventive to rust, to give stiffness to the straw, and to expedite the ripening of wheat by four or five days, Mr. Johnston sows five bushels of salt to the acre, broadcast, after seeding. He thinks, moreover, that for each of the five bushels of salt, almost an extra bushel of wheat may be expected.

SIZE OF TILES FOR MAINS AND LATERALS.

A too common error with improving farmers is that of using too small tile for main drains, and too large for laterals. Those accustomed to the roomy conduits of ordinary stone drains, suppose that nothing less than a three inch bore will conduct the drainage from the surface into the mains, and curiously enough the same persons, unmindful of the large area drained by each system of laterals, err in using mains but little larger in bore than the latter. If any are willing to look into the results of the drainage on our Central Park, the most stupendous work of the kind in this country, and one of the best conducted, they will find that the one and-a-half inch and two-inch tiles there used for laterals do not run full even after the most violent and protracted drains, and yet from a single "system" of twelve acres, the discharge after a recent rain was at the rate of 3,000 gallons per hour. This error of using too large tile Mr. Johnston fell into, and now that he has learned better after a twenty years' experience, he cautions his brother farmers against using larger than two-inch tile for laterals. For mains each farmer must provide as the quantity of water to be conducted is greater or less. In many cases Mr. Johnston has used two rows of four-inch, in others six-inch, and in one, semi-circles of eleven inches, one at top and one at bottom, making a pipe nine inches bore to discharge water. At first he had many to take up and replace with large pipe to secure a complete discharge. Main drains he makes six to eight inches deeper than those emptying into them—not with an abrupt shoulder, but leveled up, so that the descent may take place gradually in the length of two tiles—29 inches—and always giving the laterals a slight sidewise direction at the end, so that their water will be discharged down stream into the mains.

Another error he at first fell into was, in having too many drains on lowlands and not enough on the upperland; thus seeking to carry off the effect, while the cause—the out-cropping springs on the hill-side—remained untouched. Where the source of the water is most abundant, the means for removing it should most abundantly be furnished. Rain-water falls on hills, sinks to an impervious stratum, along which it runs until it either finds a porous section through which it can fall to a lower level, or not finding such continues on the hard bottom to the side of the hill, where it crops out in the form of a spring. If this spring water is suffered to run down hill, it washes the hill-side more or less, and coming to the lowland, sinks as far as it may into the soil, makes it sodden, and produces bad effects. To drain effectually, then, we must cut off the supply above and fewer drains will be necessary below. Here is the whole secret of the thing, and here we see why so much money is spent to so little purpose by those who think that they should only drain the wet lowland. Appearances are deceitful, and we should not suppose that a seemingly dry upland is really dry.

FEEDING CATTLE AND SHEEP.

A word as to this most important subject. On poor lands, good crops are got by the use of much manure. This all know. But do they know as well that all manure is not equally good? that a cord of it that has been leached by drenching rains throughout fall and winter, and that has been shone upon by the sun through a hundred hot days, has lost the greatest part of its efficacy? That the rivulets of brown liquor that run from the barn-yard into the public road will make more wheat than the brown-washed straw which remains? And that, be manure ever so well cared for, its value may be increased at will by the food given to the animals that make it? If they don't, Mr. Johnston does; and so, instead of freezing his stock until they are almost in *articulo mortis*, and starving them on dry stalks and refuse hay until the bones well nigh pierce the skin, he has comfortable sheds and deeply-littered yards for his cattle, and feeds them well at regular intervals with sweet hay, oilcake, bean-meal, and grain. The result—but what other could you expect?—is that in spring they are in store condition; he loses none, has no disease among them, saves a large quantity of such manure that one cord of it will bring more wheat or corn than four of ordinary dung, and he grows rich. Reader, if you desire to be a good farmer, go and do likewise!

CARE OF SHEEP.

Mr. Johnston bought thirty Leicesters one fall, put them in his yards, fed them each with twelve ounces of oil-meal with wheat-straw, and *no hay* all winter. In spring he sheared from them 5 lbs. of wool each, pastured them all summer, kept them over until the following February, and sold them for *nine dollars and twenty cents* each. They cost him two dollars. Sheep fed with oilcake meal or grain eat but little salt, make richer manure, more wool, and more carcass. He gives usually one pound of oil-meal when feeding with straw, and half-a-pound with hay. If there should be any signs of foot-rot in the flock, he pares the hoof and rubs into the sores a salve of blue vitriol and lard. In very hot weather he mixes tar with the salve, to make it adhere. Sheep are never let out of the yards in winter, but to the yard they have free access at all times from the low, open sheds, and every part of the shed and yard is deeply bedded with clean straw. The shepherd, instead of wading through a slough worse than that described by Bunyan, walks on a soft bed of straw, so clean at any time as not to soil the white fleece of the cleanest Leicester.—*New York Weekly Tribune.*

AIR DRAINAGE.

The essential elements of vegetable production that are more or less under artificial control are three—earth, air, and water: and it may be affirmed that a proper regulation of these three elements is all that is necessary in the vast proportion of farms within the temperate zone.

The earth must be alternately and thoroughly air-soaked and water-soaked; and it will ultimately be found that the one greatest use of the soil is to decompose the air, the oxygen becoming fixed by oxidisable substances, and the nitrogen absorbed by the living plants. Hence, drainage is so necessary even in dry land, not by promoting the discharge of water *per se*, but by promoting the admission of air, which must rush in and fill the soil that the water is leaving immediately, and with the same velocity, and in the same volume.

But granting these premises, it may be truly alleged that soils vary through a wide range as to their greater or less affinity for oxygen, some being highly oxidisable, others, as the purely silicious, having scarcely any appreciable attraction for it. Hence the necessity for all kinds of manures, which act not in the way that they are generally supposed, viz., in supplying food to the plants by direct appropriation of the matter of the manure, but chiefly by adding those oxidisable substances to the soil which will promote the decomposition of the air, the quantitative analysis of the vegetable constituents of any crop proving, beyond all doubt, that the manure could not have yielded more than a minute fractional part, even if it had all been so assimilated.

Under this view, it is easy to understand how new lands are for a few years generally fertile, but gradually lose their oxidisable appetites, and become chemically inert, unless they are rendered active by artificial addition of some compost.

Nevertheless, where one field is really inert chemically, a thousand are only apparently so, the soil not having been sufficiently aërated, either from the density or tenacity of the subsoil, or defective drainage, an alteration in these conditions immediately restoring fertility.

If the question were put to any mind conversant with such subjects, What action would air and water exercise upon a lump of flint? the answer for all practical purposes would be *nil*; and as the purely silicious sands are merely an aggregation of minute flint stones, the inference is obvious. Therefore, it is easy to conceive how fortuitously one field should bear a dozen crops of wheat successively, without any manure or compost of any kind, and another, of different chemical constituents, should require the constant addition of some extraneous matter, either by stock or otherwise.

Yet, these latter instances are decidedly the exceptional ones, the great majority of our lands suffering from the occlusion of elementary influences, and really possessing all the properties essential to fertility, if they were favourably arranged for the free percolation of air and water.

It is really surprising how extensive is the impression that water is like some deleterious substance or poison to land; and therefore the chief and sole idea of hundreds of farmers is to get rid of it at any price, not reflecting that as is the egress of water, so is the ingress of air, the exchange being effected *pari passu*; and it seems probable that the final purpose of the shower is not merely to afford the essential drink to the living plant, but to displace the stagnant air in the soil, and renew it by percolation.

Nearly every field is differently situated naturally with reference to drainage, the different angles of surface inclination, the nature of subsoil, and the character of underlying rocks, whether open or close, or having favourable or unfavourable stratification. Happy and fortunate is the farmer who has all these things favourable, and on whose farm the heaviest thunder shower passes through from the surface downwards, like a sieve. If the chemical nature of his soil will bear continuously such active chemistry as must result under these circumstances, he may enlarge his barns, or send his sons to college. AZYGOS.

THE ROYAL AGRICULTURAL IMPROVEMENT SOCIETY OF IRELAND.

The half-yearly General Meeting was held in the Farmers' Club Rooms, Dublin, on Thursday, Dec. 22, 1859. The Duke of Leinster in the chair.

The proceedings were confined to the reading of the following report, which was received and adopted:

"Your council have the pleasure to submit their usual half-yearly report of the transactions of the Society for the past six months, and they feel gratified in congratulating the members upon its sound and prosperous position. Since the commencement of the present year, 145 new members have been elected, while the retirements, so far as have been officially notified, number but six.

"Your council, however, feeling satisfied that the society should be more generally supported by those who reap a large benefit by its exertions, viz., the proprietors and landholders, appointed a committee to consider the best means to carry out this desirable object; and, in accordance with their report, three gentlemen in each county have been deputed to bring the objects of the society and its general constitution immediately before the residents in their respective localities; and your council have much pleasure in stating that the result is very satisfactory.

"The annual cattle show of the society at Dundalk was most successful. The entries of live stock were very numerous, especially of sheep, which far exceeded that of any previous meeting, and your council have much pleasure in referring to the magnificent array in the implement department, and to the complete success which attended the withdrawal of the prizes from this particular class.

"Your council cannot close their observations on this subject without drawing the special notice of the society to the admirable arrangements carried out most efficiently and energetically by the local committee, and to the hearty zeal and unceasing efforts of the director of the show-yard, Mr. T. R. Hardy, the judges and stewards, and to the respective railway and steamboat companies for their liberality in the transmission of stock, &c., all of which tended to bring the meeting to a satisfactory conclusion, and to materially enhance the interests of the society.

"Your council beg to submit herewith an abstract of the receipts and disbursements connected with the show. Receipts—Received from local committee towards the payments of premiums, £500; balance, £330. Total, £830. Disbursements—Amount of premiums awarded, including cost of medals, £619 5s.; travelling expenses of judges, £108 1s. 4d.; expenses of secretary and staff, £48 19s. 2d.; printing for show, £33 12s. 6d.; sundries, including advertisements, £20 6s. Total, £830.

"In the usual routine, the society's cattle show for 1860 should be held in the province of Connaught, but that district declining to send forward an invitation, your council have accepted that of Cork, for the province of Munster, to hold their meeting next year in that city. The local committee there have already obtained from the respective rail and steamboat companies free transit for all articles to be exhibited, both to and from the show; and from the highly successful meetings which the society has had on former occasions in that locality, owing to the hearty and liberal co-operation and support of all classes, the happiest results may be anticipated.

"Your council learn with satisfaction that the transactions of the local societies for the past year have been very successful, and that the amendments made in the prizes offered by the parent society have been found to work well, and prove beneficial.

"Your council feel it their duty again to urge on the public a generous support to these important and useful institutions, which are so eminently calculated to assist in the general object of agricultural progress, as bringing more immediately before the working farmer implements of husbandry, by the use of which he alone can expect to reap the advantages resulting therefrom.

"Your council have reason to suppose that the competition for the cottage medals will be large; and they have no doubt that the cup so gracefully presented to the society by his Grace the Duke of Leinster will prove a powerful aid to the society in the furtherance of the object of the improvement of labourers' cottages.

"Your council have the honour to report that the society will shortly be incorporated under royal charter, a handsome recognition of the public usefulness of the society, and of the beneficial influence which its operations diffuse through all classes in this country.

"The council regret to have to report that since the last general meeting the retirement has taken place of Mr. Royse from the situation of secretary, a post which he had filled to their entire satisfaction, and that John Thornhill, Esq., has been elected after a careful investigation into the respective merits of 17 candidates, who offered themselves for the appointment."

COMMERCIAL AND AGRICULTURAL VALUE OF CERTAIN PHOSPHATIC ROCKS OF THE ANGUILLA ISLES, IN THE LEEWARD ISLANDS.

Sir,—A few weeks ago I perceived in your journal a communication from Sir Roderick Impey Murchison, V.P.R.S., to the *Journal* of the Royal Agricultural Society of England, respecting the commercial and agricultural value of certain phosphatic rocks of the Anguilla Isles in the Leeward Islands: conveying information which cannot be made too generally known, nor too highly appreciated, either in a commercial or national point of view. For no sooner had the researches in organic chemistry during the last twenty years explained the elaborations of vegetable economy, and reduced agricultural operations comparatively to definite laws, by defining the nature and determining the relative proportions of these elementary and compound bodies ever present and indispensable to the mature development of whatever crop it is the object of the farmer to cultivate, than arose the question, From whence was an adequate supply of those indispensable inorganic constituents to be derived? For, notwithstanding there are many subjects connected with the daily operations of the farm yet to be discussed, it is generally admitted by all acquainted with the great achievements in modern agriculture, that wherever a commensurate amount of capital and science are brought into operation in this important field of national industry, few investments are calculated to ensure more certain and remunerative returns; and none conferring more permanent good upon the country at large, as it directs the energies and enterprise of a vast portion of the community to be expended in a cause which must inevitably expedite the general development of our agricultural resources, and augment to an indefinite extent the annual produce of the soil. Now to render the present refined state of chemical analysis subservient to the daily operations of practical husbandry, it is not only essentially necessary that the farmer should know the nature of the mineral and saline ingredients extracted from the soil by the crops raised, but that he should have the means of restoring to the land any of those ingredients indispensable to the proper development of a crop of which it may be deficient. For example, I need only remark that either roots or cereals will vegetate with considerable luxuriance up to a certain period of their growth, during which time they had expended their sustenance in the formation of cellular tissue; and for want of alkaline and earthy phosphates, and azotized matter, the plants cannot attain proper maturity, and we obtain bulk with little nutritious virtue.

To enable the practical farmer to fully comprehend the important mission assigned to inorganic matter in the economy of vegetable physiology, it is only necessary to estimate the quantity of these substances removed from the soil by a ton of each of the following grasses;—

Inorganic Substances.	Italian Rye-grass Hay.	Clover Hay.		Lucerne Hay.
		Red.	White.	
	Lbs.	Lbs.	Lbs.	Lbs.
Phosphoric acid ...	9·00	10·00	20·00	29·00
Potash	17·00	26·00	24·70	30·00
Soda	7·50	3·50	10·70	13·70
Lime	13·25	55·60	45·25	107·75
Magnesia	3·00	17·20	14·00	7·25
Oxide of iron.........	1·00	1·50	3·50	·75
Sulphuric acid	4·25	6·75	12·40	9·00
Chlorine	2·00	4·00	5·10	6·75
Silica............	81·75	5·10	6·00	7·40
Alumina	Trace	Trace	Trace	Trace
Total quantity...	138·75	129·65	141·65	211·60

From the above statement it appears that the mineral and saline ingredients extracted from the soil by the different grasses cited consists, in the aggregate, of alkaline and earthy phosphates, but assimilated in very different proportions by the respective plants named.

Thus we find, by contrasting lucerne with rye-grass, that the former extracts from the soil close upon 380 per cent. more of these materials than the latter, showing that one species of grass may be cultivated with advantage upon a soil totally incompetent to produce the other, without the agriculturist can avail himself of the means to correct the defect. And the history of all ancient states establishes the fact, that no system of culture can compensate for the inordinate quantities of these valuable substances removed from the soil in remote parts of the country in the form of milk, corn, cattle, or any other form the produce may assume, without we return quantities equivalent to those removed. As soon as the great fertilizing power of phosphatic compounds was known, the attention of many of the leading scientific men of the day was directed towards discovering a source from whence a permanent supply could be had. And at that time it was currently reported that a considerable deposit of phosphate of lime existed in the Spanish province of Estremadura; but after a personal survey of the deposit by Dr. Daubeny, it was found unavailable to the purposes of British agriculture, chiefly arising from the expense of transport.

Indeed, various and extensive explorations have been made by many eminent professional and scientific gentlemen throughout the entire range of the cretaceous series of strata; and although many of these deposits contained phosphoric acid, except the phosphatic fossils of Suffolk and Essex discovered by Professor Henslow, and now extensively used as a substitute for bones in the manufacture of superphosphate of lime, little was effected to promote the interest of agriculture. And however much an adequate supply of mineral manure was felt at that time, its value in agricultural operations has very much increased since the passing of the Corn Law, inasmuch as the farmer has been compelled, from the low price of grain, to turn his attention more to grazing. And if attention is directed to the rearing and fattening of cattle and sheep, an adequate supply of earthy and alkaline phosphates becomes more imperative, as they enter largely into the structure of all animals, and necessarily forms the most valuable portion of the food they consume. For instance, phosphate of lime forms from 50 to 60 per cent. of all the bone reared and exported from the farm; and the alkaline phosphates constitute from 70 to 75 per cent. of the ashes of both flesh and blood, also forming about 80 per cent. of the ashes of the most valuable food for cattle and sheep.

After chemistry had elicited the important part assigned to these phosphatic compounds in both animal and vegetable life, it will be admitted that a plentiful supply of those ingredients is of the greatest importance to practical agriculture. And it is with that view that I now point out the Island of Sombrero as the means of supplying these necessary requirements of the day.

The Island of Sombrero was visited so early as 1814 by an English gentleman, and again about 1825, on which occasion a report was made to the British Government; but it was not until 1856 that the Americans discovered this extraordinary deposit of *phosphatic guano*, and at once took possession of the island. And since that time large quantities have been imported into the Southern States to replenish the exhausted tobacco and cotton fields, and which has been attended with surprising effect.

Since Sir R. I. Murchison's communication appeared in your journal, I have had an opportunity of examining a cargo of a thousand tons discharged in the port of London, ex "Rochembean," from which the accompanying specimens are selected, and are equally rich in phosphatic compounds as those which Sir Roderick had analyzed from the same island, varying from 75 to 90 per cent., according to the nature and locality of the strata from which the specimen is taken. The geological formation of the island appears to be marine and phosphatic breccia, and constitutes the most valuable source of mineral manure at present available to the agricultural requirements of the age; and fully impressed with the belief that great good will result from its peculiar properties being generally known throughout our agricultural districts, I have ventured to submit these observations for your consideration, if you deem them worthy a place in your widely-circulated journal.

A MODERN AGRICULTURIST.

ROYAL AGRICULTURAL COLLEGE.

The Session was brought to a close on Tuesday evening, Dec. 20, 1859, the Examination having ended on the previous day. Edward Holland, Esq., M.P., chairman of the Committee of Management, awarded the Diplomas and Prizes, and the Choral Society of the College treated the visitors with a concert, which, above the average in quality, was fully appreciated by the audience.

We are happy to say that a fewer number of In-students are leaving this Session than usual, the number being only sixteen. It is gratifying also to be able to state that the applications for admission, besides being more numerous, are from men of an age likely to derive full advantage from a collegiate system, and that there is a fair chance of the College being satisfactorily filled.

PRIZE AND CLASS LIST, CHRISTMAS, 1859.

DIPLOMA awarded to—1. J. Appleby, Fareham, Hants; 2. J. Hull, Poulton Vicarage, Preston, Lancashire; 3. C. Selby Bigge, Lyndon, Morpeth, Northumberland.

THE HAYGARTH PRIZE was awarded to Mr. Appleby.

FARM BOOKS.

1 Doxat
2 Deacon
3 Gibbon
Nunnerly } *very highly commended*
Wooodrow
Mounsey } *highly commended*
Phillips—*commended*

FARM JOURNALS.

1 Turner
Negus
Hounsfield—*very highly com.*
Smith—*highly commended*
Topham
Russell } *commended*

AGRICULTURE.

1st Division.

1 Appleby
Doxat
3 Hull
Ivey
5 Deacon
Dixie
7 Bigge
8 Gibbon
9 Nunnerley
10 Woodrow
11 Dayman
Harding
13 Cooper
14 Mounsey
Phillips
16 Allanson
Turner
18 Tindall
19 T. Newton
20 Duntze
21 Gilbert
22 Parry
23 Dawson
Johnstone
25 Brockman
F. Newton
27 Booth
Fitzherbert
29 Baldock
Robinson
31 Day
Salmon

2nd Division.

1 Negus
Smith
3 Hounsfield
4 Pope
5 Pickering
6 Twynam
7 Skeels
Russell
9 Graves
Rostron
11 Baron
12 Alexander
Cooke
Geneste
C. M. Jones
16 Byrch
Lockwood

LABORATORY PRIZES.

Classes 1 & 2—Ivey
Appleby—*highly com.*
Inner Laboratory—Prentice, Phillips
3 & 4—Allanson
Gibbon—*com'end d*
5 & 6—Boucicaut
Pope—*highly com.*
Smith, Topham—*commended*

VETERINARY.

Classes 1 & 2.
Hospital Books—Doxat
Ivey
Classes 3, 4, 5, & 6.
Note Books—Boucicaut

BOTANY.—*Note Book.*

Classes 1 & 2—Denne
Doxat
Newton } *highly commended*

AGRONOMICS.

Classes 3, 4, 5, & 6—Boucicaut
Hoare—*highly commended*

SURVEYING.—*Field Book.*

Classes 1 & 2—Denne
3 & 4—Allanson
Classes 5 & 6—Smith
Hounsfield—*very highly com.*

BUILDING.

1 Hull
Appleby
Ivey } *highly commended*

MATHEMATICS.—Ivey, Appleby.

General Proficiency—Hounsfield
Allanson

General Industry—Harding

BOTANY.

1 Bigge
Denne
Doxat
4 Hull
5 Ivey
6 Appleby
—
7 Dixie
8 Phillips
9 Woodrow
10 T. Newton
11 Dayman
12 Cooper
13 Gilbert
Tindall
15 F. Newton
16 Robinson
—
17 Parry
18 Johnstone
19 Booth

AGRONOMICS.

1 Deacon
Harding
3 Smith
4 Allanson
Hounsfield
6 Dawson
Nunnerley
—
8 Negus
9 Fitzherbert
10 Cotton
11 Skeels
12 Pickering
13 Byrch
14 A. Russell
15 Geneste
16 Boucicaut
17 Turner
Davis
19 Baldock
20 Brockman
21 Pope
22 Gibbon
23 Twynam
24 Topham
25 Baron
26 Lockwood
27 Graves
28 Rostron
29 Salmon
30 Day

CHEMISTRY.—*Classes* 1 & 2.

1 Ivey
2 Appleby
3 Hull
4 Bigge
5 Dixie
6 Doxat
7 Twamley
8 Clarke
9 Prentice
10 Phillips
11 Cooper
12 T. Newton
13 Woodrow
14 Tindall
15 Dayman
16 Johnstone
17 F. Newton
18 Parry
19 Robinson

Classes 3, 4, 5, & 6.

1 Deacon
2 Allanson
3 Smith
4 Harding
5 Pickering
6 Negus
7 Nunnerley
Gibbon
9 Mounsey
10 Dawson
11 Hounsfield
12 Cotton
13 Jones
14 Boucicaut
15 Fitzherbert
16 Hoare
17 Day
18 Cooke
19 Byrch
20 Davis
21 Russell
22 Geneste
23 Pope
24 Alexander
25 Brockman
26 Lockwood
27 Salmon
28 Baldock
Baron
30 Skeels
31 Graves
32 Rostron

PATHOLOGY.

1 Denne
Doxat
3 Ivey
Bigge
Hull
6 Dixie
7 Appleby
8 Tindall
9 Woodrow
10 Gilbert
11 Dayman
12 Booth
13 Parry
Johnstone
15 Cooper
16 F. Newton
17 Robinson

ANATOMY.

1 Deacon
2 Allanson
3 Harding
4 Smith
Nunnerley
6 Negus
Hounsfield
8 Byrch
Pickering
Dawson
11 Davis
12 Mounsey
Gibbon
14 Cotton
15 Day
13 Russell
Alexander
Boucicaut
19 Cooke
Geneste
21 Turner
22 Salmon
23 Fitzherbert
Rostron
25 Skeels
26 Graves
27 Baldock
Baron
29 Brockman
30 Rockwood

SURVEYING.

Classes 1 & 2.

1 Hull
2 Ivey
3 Appleby
4 Bigge
5 Tindall
6 Dixie
7 Dayman
8 Denne
9 Newton, F.
10 Newton, T.
Woodrow
12 Cooper
Parry
14 Booth
15 Gilbert
16 Johnstone
Robinton

Classes 3 & 4.

1 Deacon
2 Brockman
3 Allanson
4 Nunnerley
5 Harding
6 Davis
7 Dawson
8 Mounsey
9 Day
10 Gibbon
11 Salmon
12 Baldock
Fitzherbert
Turner

Classes 5 & 6.

1 Smith
2 Hounsfield
3 Pickering
4 Geneste
5 Twynam
6 Cotton
7 Cooke
8 Graves
9 Russell
10 Rostron
11 Negus
12 Baron
13 Byrch
14 Skeels
15 Boucicaut
16 Alexander
Lockwood
Topham

Of the concert alluded to above, we are sorry that want of space prevents us from going into full particulars. The choruses and the music allotted to the band were conducted by Mr. Ann, their teacher, and considering that they had received but two months' lessons from him, their performance was highly respectable. The song "Hohenlinden," sung by Mr. Johnstone, and the duet, "Flow, gentle Deva," sung by Messrs. Brown and Johnstone, were unanimously redemanded, and politely responded to by the executants. The "Hautbois solo," performed by Mr. Boucicaut, was admirably rendered. Mr. Cary, in two quartetts with Messrs Brown, Hensley, and Boucicaut, showed himself to be a promising flute player. Mr. Hensley (who is a thorough musician) presided at the pianoforte, and rendered the parts allotted to him with great taste and judgment. Suffice it to say that all went off well, and leaves us to expect a very excellent performance at some future period.

THE NEW YEAR.

Christmas has again come and gone, but not without leaving us wherewith to "point a moral." Independently of the more grave and serious origin of this institution, there is wisdom in the social festivities by which it is attended. They constitute a salutary break upon the sombre reflections suggested by the last moments of the expiring year, and thus prepare the mind the better to appreciate the cheering and hopeful advent of the new. The assembling of friends and relatives once a year is in itself an important event to the members of a family, upon which the mind dwells, both in its anticipation and retrospect, with peculiar pleasure, especially when time and distance have served to separate them. A hundred sources of enjoyment arising out of the benevolent feelings excited by the return of Christmas tend to strengthen and perpetuate the ties of kindred and friendship; and it is only the depraved and heartless upon whom the incidents of the season produce no salutary influence.

Having paid this tribute of respect to the memory of the past, our aspirations are called forth to hail the new year as the harbinger of hopeful anticipations. The fulfilment of those hopes, be it recollected, depends in a great measure upon ourselves. There is a saying, as old as Solomon, but it may with much propriety be adopted, both as a motto and as a rule of action, for the ensuing year. It is "Whatsoever thy hand findeth to do, do it with thy might." This proverb applies to every station in life and to every department of business, especially to that of agriculture; on the punctual and timely performance of the operations of which so mainly depends their success. Franklin has a homely illustration of the folly of procrastination, and of the evil consequences that frequently arise from apparently slight neglect: "*For want of a nail the shoe was lost; for want of a shoe the horse was lost; for want of a horse the rider was lost, being overtaken and slain by the enemy; and all for want of a little care about a horse-shoe nail.*" Let us proceed to apply these aphorisms and illustrations to the subject of agriculture.

Many years ago there was a farmer in Norfolk who, in the management of his holding, adopted the reverse course, his motto on all occasions being—"There's no need to be in a hurry; there's plenty of time." And so universally did he act upon this procrastinating principle, that, his house happening to take fire whilst he was at breakfast, he replied to those who rushed in to apprise him of it, "Well, we shan't need to be in a hurry; I'll just eat this mouthful of bread-and-cheese first, and 'll then come and see about it." And he sat in the chimney-corner till the fire fell at his feet, so that he was literally "burnt out." Fortunately, the accident was confined to the chimney, and the neighbours had taken the precautions necessary to extinguish it before he made his appearance. But it may readily be conceived that with such a "rule of action," his farm went to "rack and ruin," and he was reduced to poverty. In the same county there is another farmer, who cultivates about a thousand acres. It was at the commencement of the general harvest, and a considerable fall of rain had taken place. "Well, Farmer," said a friend, who was a miller, "how goes on the harvest?" "Why," he replied, "I availed myself of the fine weather, and began cutting my wheat early; and I got one hundred acres under cover before the rain fell; and as it is likely to be a catchy time, I shall leave the rest till it is ripe enough to 'cut and carry,' as it is free from 'rubbish.' My men are now engaged in ploughing up the stubbles."

Ludicrous as the conduct of the first man may have been, it is but the transcript of that of many, who, instead of seizing Time by the forelock,' allow the right moment for the right work to slip by, and afterwards endeavour to overtake Time by a hurried effort to atone for their neglect. Lord Chesterfield says: "A man of sense may be in *haste*, but will never be in a *hurry*." The distinction may appear fanciful; but it is strictly true. *Haste* implies a consciousness of the importance of performing an act or operation at the season in which it is most proper to be done; *hurry*, on the contrary, displays a conviction of having, by neglect, allowed the proper season to pass by unimproved, and is but a nervous attempt to make up the loss by accelerated speed in performing the work. Whatever is done in a hurry, is, in most cases, done ill—the very speed with which, by implication, the operation is performed, being inimical to anything being done properly.

But mark, next, the forethought of the other example. His crop of wheat was early ripe, because it was sown in good time in the previous autumn. It was free from weeds or "rubbish" because the horse-hoe was well employed during the summer. The consequence was he was enabled to cut the first ripe, before his neighbours had any ready. Thus acting upon his own judgment regarding the weather, he secured half his crop; whilst the cleanness of the land afforded him an opportunity of "cutting and carrying" the rest, at any time when a dry day occurred. The ploughing-up of the stubbles, too, as an interlude, when the weather was too damp for harvest-work, was a further illustration of seizing Time by the forelock, and of the principle embraced in the motto: "Whatsoever thy hand findeth to do, do it with thy might."

The vicissitudes of the seasons and liability to accidents, both of property and person, are the great thorns in the side of the farmer; but the thoughtful and provident have the remedy, to a great extent, in their own hands. But do the farmers in general use it? How many, for instance, of those who suffered so severely by the storms of last summer and autumn were insured? How many farmers per cent., whose property is so exposed to incendiarism, have insured against fire? How many young farmers, with rising families, have insured their lives, so liable to casualties and accidents terminating in death? Ask any number of them whether these necessary precautions have been attended to, and it is probable that a large proportion, whilst admitting the prudence of such a step, will acknowledge they have not taken it, though they intend to do so. We earnestly press upon them *now*, at the commencement of the new year, to set themselves right in these respects, and be thus provided against all casualties that may happen any day or hour, to their otherwise utter destruction. What peace of mind can a farmer enjoy, whose life and property are risked from year to year, when the remedy is so cheap and so continually at his call? On the other hand, he who has made the necessary provision against all casualties, can sleep with an easy mind, and, so far as his family are concerned, with a clear conscience too. Depend upon it, the man whose prospects and those of his family, are destroyed by events against which he might have provided, will feel a self-reproach that must embitter his future days.

Let us take an illustration of the contrary conduct. A friend had occasion to borrow £2,000 of his banker, for which his brother-in-law became security. The latter was a hale, hearty farmer of about 50 years of age, and, so far as his constitution was concerned, likely to live to an advanced period. Upon signing the security he said to the other: "Now, life is uncertain; and if I die the bank will instantly call in their money, which my executors will, of course, look to you to pay. This will break you up, unless my life is insured. *Go to-day* and pay the deposit, and then you will be safe." His friend went immediately and gave instructions for the insurance, paid the deposit, and left the secretary to make out the policy at his leisure. Mark the result: *one month* after, and only *two days* after the policy had been delivered, his brother-in-law was mounting a spirited young horse, which he had himself broken in. As he put his leg over the saddle the horse started and threw him. His head came in contact with a stone, which rather stunned him; but he recovered, again mounted, and rode round his farm. On his return home he said to his wife: "My dear, send for a doctor: I have had a fall, and my head-aches." He then lay down upon a couch, and very soon became insensible. He had sustained a concussion of the brain; and before the doctor arrived, he was beyond the reach of medicine, and died in a few hours. His relative thus received the immediate benefit of the trifling sum he had paid, and at once discharged his obligation to his bankers, while the family had the further advantage of this commendable caution and forethought. "Whatsoever thy hand findeth to do, do it with thy might."

A careful and vigilant attention to the motto, then, in business-affairs, is confessedly of great importance to the security and peace of mind of the farmer; but we may be allowed to remind him that, in this respect, it is but secondary to that which is its proper application. There is a sequel, too, to the passage, which enhances its strength and meaning to an indefinite degree: "Whatsoever thy hand findeth to do, do it with thy might; for there is no work, nor device, nor knowledge, nor wisdom, in the grave, whither thou goest."

In spite of infidelity and scepticism, the belief in the existence of the soul of man after death, in a state of happiness or misery, is that of the large majority of men. At the same time, we fear that a provision against the consequences of death is too often procrastinated to the last moment, when the mind is distracted as well by disease as by a multitude of questions necessary if possible to be settled. If then it is madness to neglect the precautions requisite for the security of our temporal affairs, how much more unwise is it to put off the preparation for that eternity to which we are daily hastening, and of the nearness of which we are so uncertain! If the insurance of our property imparts peace and a sense of security to the mind, how much more will an insurance in that Bank which never fails divest the mind of all anxiety for the future, whether in life or death! "Religion," says an old writer, "procures peace of mind under prosperity, consolation under affliction, the prospect of God's blessing in this life, and the assurance of eternal happiness in the life to come."

THE AGRICULTURAL TRADE OF SCOTLAND.

At this season of the year the annual circulars of brokers and merchants crowd in upon us from every port and district of the kingdom, and to the most important of these we endeavour to give extended publicity for general information. The comparison of opinions, and the elaborate details collected by many an observant mind in the course of extensive business transactions, cannot fail to be useful. There has been of late a manifest improvement, year by year, in the style and matter of these circular reports, in which the United States were wont to be before us.

A collection of these would form the best history of the progress of agriculture and commerce in its several departments, and we are surprised no one has hitherto thought of arranging and publishing them. It is true that they are, to some extent, only interesting to those who have transactions in particular articles, and the produce brokers and merchants keep themselves well advised on all these matters. Still there is a large outside circle of persons more or less interested either in production, shipment, speculation, and consumption, as well as the legislators and political economists, who could not fail to gain much valuable information by watching the advance or retrogression of particular trades—the increase or decline of imports and consumption of particular articles—the sources of supply, and the gradual changes that arise therein—the varying costs of freight and range of prices. All these, and many other topics incidentally connected therewith, arise out of a careful study of the trade circulars. They supply too, to some extent, an index of our exports of manufactures and customers, and the fluctuations that arise in the shipment of our great manufacturing industries, whether they be cottons or woollens, iron or coal.

The Chambers of Commerce, of which there are now so many in the country, have thrown themselves energetically into the creditable work of watching and developing trade interests. And although there is no combination of this kind among the agricultural interest, if we except the occasional business meetings and casual discussion on market days at Mark Lane, and at the Metropolitan and local Farmers' Clubs, yet there are many very admirable agricultural circulars issued by importers and merchants.

This prelude has drawn us somewhat aside from the object we had in view, which was to direct attention to the agricultural trade of Scotland for the past year. The agricultural statistics collected for several years past in the northern part of the kingdom kept us well informed of the main elements of cultivation and production, of crops and live stock, of all relating to the internal progress of North Britain. But, as it is desirable to know also what is its external trade, we avail ourselves of the opportunity afforded by some of the annual circulars, to examine those features of imports, consumption, and stock of articles interesting to the agriculturist. The Clyde may be considered to some extent the great entrepôt of the foreign commerce of Scotland, the imports into Leith and other eastern ports being trifling in comparison with Glasgow.

Taking first the grain, we find that the imports of wheat into Glasgow and Leith last year were much in excess of those of the previous year. Messrs. W. Connal and Co., of Glasgow, in their annual circular, state that considerably less barrel flour has been received from Canada and the United States, but it has been made up by the increase in sack flour from France and other continental countries. The reported deficiency in the crops of the United Kingdom have no doubt contributed much to the present firmness in prices. The quality of the new grain of England is very various, but it is gratifying to know that in Scotland it is good, and that the new Baltic wheats now arriving are better in quality and condition than for some years past, many of the parcels weighing 63lbs. per imperial bushel. The high price at which fodder now sells gives confidence to the holders of spring corn that ere long enhanced rates will be obtained. Still the most remarkable feature in the Scotch grain trade of last year is the extent of the stocks in the granaries of Glasgow, which are considerably larger than at any former period. There are now 400,000 bolls of foreign wheat and 43,000 of British and Irish wheat, or double the quantity at the same time last year.

The import of guano into the Clyde during the past year appears to have been limited, compared with former years, comprising only 5,633 tons, of which 1,500 tons were Peruvian. The chief demand was for this description; the price remained stationary at £12 to £13 per ton. The value of other sorts has fluctuated considerably, prices ranging from £4 to £8 per ton, the present quotations being nearly 30 per cent. under those ruling two years ago. The great discrepancy in price between these and Peruvian is beginning to attract attention, as the scarcity and high prices of every article for fodder and cattle-feeding will, in all probability, lead to an extended consumption. It is believed that the farmer by a judicious use, more particularly of those qualities rich in phosphates, along with Peruvian, would effect a saving of fully 30 per cent. During the last few years there has been little inducement to prosecute the importation of these descriptions, which, notwithstanding the unprecedentedly low freights, has been attended with serious loss. In many cases the prices realized for cargoes from Chili, Bolivia, San Francisco, Kooria Mooria, and other deposits, have much exceeded the freight and charges. The supply from these sources for the ensuing season is expected to be small, while that from the Chincha Islands, from the small amount of tonnage believed to be engaged, is likely to be on a moderate scale. The annual consumption of all sorts, in the United Kingdom, is calculated at about 250,000 tons. The imports in 1857 were 288,362 tons, and in 1858, 353,541 tons; of which 264,230 tons and 302,207 tons respectively were Peruvian. In the eleven months of last year the imports of all sorts were only 78,651 tons. The present stock in the Clyde is 2,830 tons, of which only some 20 tons is Peruvian.

There is another article which has been brought into the Clyde largely, namely ashes, the imports having been 11,645 barrels, against an import of 7,888 barrels in 1858. The stock held is small. We need not go into the details of timber imports, cotton, and general articles of colonial and foreign produce. We have done enough to direct attention to the import trade of articles of agricultural produce and those in which farmers are most interested. We may refer, in conclusion, to the very comfortable condition of the great mass of the population in the north as well as the south, and though there may be a tendency towards an advance in the prices of food, the prospects for the present year to both labourers and capitalists are, we believe, full of hopeful promise.

TRADE OF THE PORT OF HULL.

REVIEW FOR THE YEAR 1859.

The present year has been one of successful commercial enterprize generally, and yet characterized by an almost total absence of speculative action. Money has been abundant and discounts low, the raw material buoyant, and manufacturers unprecedentedly active; at the same time the staple food of the people has continued moderate in price. We thus close a year of sound and extensive business, with prospects of its continuation during the next. The tonnage entering the port this year amounts to 1,137,926 tons, being 51,229 tons above that of 1857 and '58, which were nearly equal. The steam tonnage exhibits a slight increase, being 41,432 tons and 40,541 tons respectively; that of vessels reported inwards on foreign voyages is 780,212 tons, against 748,463 tons in 1858, being an increase of 31,749 tons.

WHEAT.—The import of this article this year is 203,344 qrs., showing a falling off of nearly 60,000 qrs. as respects last year, and 83,000 qrs. in 1857. In reviewing the course of the wheat-trade for the past year, the most striking feature that presents itself is, with one or two exceptions, the extremely moderate fluctuation in price of an article of such importance as to be justly designated "the staff of life." This may be partly accounted for by the concurrence of two consecutive favourable harvests, both in this kingdom and in most of the chief corn-producing countries on the continent of Europe, and partly by the increased facilities afforded by the telegraph, and the rapid transit by the introduction of a greater amount of steam tonnage in the carrying trade, a mode of conveyance which is every year increasing. The facility thus afforded to business in the present day apparently does away with the old-fashioned system of hoarding corn for a lengthened period of time; and as the British grower is brought into such constant competition with the foreign producer, more reliance appears to be placed by him on increased exertions and the improved cultivation of the land, than on any artificial means of attempting to raise prices by withholding produce. The fact of being free to trade with all the world exercises great influence, and the value of grain is regulated by supply and demand much more than formerly, and in this respect the trade may be said to be on a more sound and legitimate footing, the fluctuations being fewer and less important. Another remarkable feature as regards wheat at the present moment is the disparity that exists in the value in this country and the prices ruling at most of the continental shipping ports. We find good red wheat quoted at Hamburg 47s. to 48s. per qr. (504 lbs.) for spring, and about the same prices ruling at Konigsberg and Stettin, whilst fine Konigsberg and Dantzig white is quoted up to 50s. to 53s. per qr. free on board for spring; thus, from no part of the world can wheat be imported to compete with home-grown at present currency. The partial failure of the crop of wheat in America in 1858 was expected to have its effect on the value in this country, but the abundance of our own, combined with the unparalleled export of breadstuffs from France as also the Low Countries, quite counterbalanced any shortcomings from our transatlantic brethren; and although the crop in the North of Europe and Rhenish Provinces was only moderate, this had but little if any influence. We commenced the present year with prices at a very moderate range, say 40s. per qr. of 504 lbs. for good red English wheat, and Norfolk flour 27s. 6d. per sack, a price lower than for six years previous. From the opening of the present year up to April but little change took place, when, owing to the uncertain state of political affairs and the disturbed condition of Central and Southern Europe, some animation was apparent, and prices advanced 2s. to 3s. per qr., English wheat being worth, about the middle of that month, 43s. to 44s. per qr. of 504 lbs.; fine old red foreign 45s. to 46s., and Dantzig 50s. to 52s. per qr. of 480 lbs. Towards the close of the month of April and during the first week in May, great excitement was produced in the grain market by the outbreak of hostilities between France and Austria, and wheat in the course of ten days advanced about 15s., and in the beginning of May 60s. per 504 lbs. was freely paid for English red. This rapid advance, however, was destined to be only of short duration; the bank rate of interest advanced, and the probability of hostilities being confined to the Italian States, caused a sharp reaction, and prices receded during the week ending 10th of May, 8s. to 10s. per qr., there being sellers of English red at 50s. This decline was partially recovered the following week to the extent of 2s. to 4s., but at the close of the mouth, we find English red again quoted 50s., and other qualities in proportion. These rates were maintained to about the middle of June, when, owing to increased arrivals from abroad, the favourable prospects for the coming crop, and the large import of French flour, prices receded fully 5s. per quarter, with some trifling advance towards the close of the month; and but little variation was apparent until about the middle of July, when, under the influence of brilliant weather, the supension of hostilities in Italy, and promises of an abundant harvest in America, English Wheat receded to 42s. to 44s. per qr. From this time up to the end of August but little change took place; the extraordinarily hot summer was found to have done injury in many districts, and the yield of the new crop, when tested by thrashing, proved deficient to a very considerable extent as compared with the harvest of 1858. Although this became a clearly ascertained fact, and also that the harvest in France and Belgium was found to be short of an average, still, owing to the surplus left over from the last crop and the accumulation of stocks in granary, we close the year with prices only about 5s. per qr. above those of this period last year as regards English Wheat and 2s. to 3s. for foreign. For the present speculation is dormant, but the stocks in granary here are held with great firmness, and growers show no disposition to bring forward any large supplies; looking to the future course of the trade, prospects for some moderate improvement may be fairly calculated upon, more especially as imports are likely to fall off very materially for some time to come; and although the stocks in granary exceed those of last year, being 95,000 qrs., the quantity of fine Wheat may not exceed half, the remainder being secondary quality, and held considerably above the present market value.

BARLEY.—We have again to record a large and important trade in the cereals, which having been based upon purely consumptive requirements, has generally speaking been a profitable one. The arrivals up to the end of the year amount to 245,728 qrs., or about 31,000 qrs. more than last year, which have been drawn from the usual channels, viz., Denmark and the Euxine; but this year the Saale and Rhine districts have also been contributors to some extent, and the English crop having proved under an average in quantity, and generally very poor in quality, Danish and German, which is of fine quality this year, has been taken eagerly by our maltsters, and given general satisfaction. Grinding qualities have also mostly all gone into consumption on arrival, and stocks altogether are slender in consequence, viz., about 8,500 qrs., against 35,000 qrs. at the end of 1858. Prices advanced gradually until the end of the malting season (May and June), when a decline of a few shillings took place; but they have since again steadily crept up, and are now at the highest point attained during the year, or about 3s. to 4s. higher than at the same period last year. Finest English is quoted in this locality 40s. to 42s., ditto foreign 38s. to 40s., medium English and foreign 34s. to 36s., all per qr. (56lbs.) Stout grinding 30s. to 31s., and thin 28s. 6d. to 29s. 6d. per qr. (52½lbs.)

OATS.—We last year reported a falling off in the import of this grain of some 38,000 qrs., and this year our tables show another considerable decrease in the imports, say of about 33,000 qrs., our total imports for the year having dwindled down to 28,366 qrs., against 61,435 qrs. in 1858. Prices were at their highest in May, when sinister rumours in connection with the war then waging also had its effect upon this article, since which time, however, they have declined about 2s., and are now about 1s. above last year at this time, good corn being worth 23s. to 24s. per qr. (42lb.) Stocks only light, say 3,700 qrs., against 8,000 qrs. end of last year.

BEANS.—Our imports have been slightly in excess of those of the preceding year, say 56,464 qrs. against 55,871 qrs. With the exception of the general rise in grain in the month of May, prices have ruled remarkably steady throughout the year, and stand at 40s. to 41s. per qr. (60lbs.) for good foreign middles, or about 2s. higher than they were marked a twelvemonth ago. Stocks in hand are computed at 8,500 qrs. (mostly Egyptian and Mazagan) against 15,500 qrs. last year.

PEAS.—Supplies from abroad have been scanty of this pulse, say only 17,806 qrs. against 25,821 qrs. last year, which deficiency, however is amply counter-balanced by the more abundant home-produce. Prices have been steady, excepting the short vibration in May, and are now within 1s. of those of last year, being 39s. to 40s. for white. Our stocks are 3,600 qrs., against 3,000 qrs. last year.

AGRICULTURAL SEED.—The season of 1859 saw some considerable variations in the values of both red and white cloverseed. At the commencement the prices of red clovers were moderate, but the reports of the deficiency of the crops in this country, and in most of the producing countries on the Continent being confirmed, prices gradually rose 5s. to 6s. per cwt. until the middle of the season, when larger supplies coming forward than was expected, chiefly from America, and of inferior descriptions of English seed, the value receded rapidly, falling about 11s. to 14s. per cwt. from its highest point, and although there was a slight reaction at the termination of the season, prices closed considerably below their opening point. The value of seed is now moderate, and as little business has been done this autumn, an active demand may cause some slight advance when the season comes on; but we do not see any reason, with the present prospects, to anticipate any material rise in value. The stock of old white clover at the commencement of last season was considerably below an average, and as the new crops (of 1858) were badly spoken of, prices opened comparatively high—say from 65s. to 85s. per cwt., according to quality; as the season progressed, however, the scarcity of offers and supplies confirmed the reported small yield, and prices rapidly advanced 20s. to 30s. per cwt., the highest price reached in this market being 115s. per cwt. The prices of trefoil were moderate during last season, and declined still further at the close, when some quantity of foreign seed was bought at easy prices to hold over, and such investments are now likely to turn out well, as the new English crop is yielding very indifferently, and the foreign supplies of new seed, it is reported, will not be large. The present values are 26s. to 28s. per cwt. for fine new seed, and 21s. to 24s. per cwt. for yearling, new English having advanced 1s. to 2s. per cwt. during the past few weeks. We see no reason why these prices should not be maintained, or perhaps even exceeded to a slight extent.

LINSEED.—This port continues its marked supremacy for this article and its products. Our direct imports of linseed this year amount to 467,755 qrs., against 376,749 qrs. last year; further receipts per rail from Liverpool and our supplies coastwise are computed at 60,000 qrs., against 42,000 qrs., making a total difference in favour of this year's import over last of 100,000 qrs., the excess being from the Black and Azoff Seas. The actual amount of seed gone into consumption (as the stock remaining in all hands, say 90,000 qrs., is nearly the same as the quantity held on the 1st of January), stand as follows:—

Stock on hand 1st January	100,000 qrs.
Imported	468,000 ,,
Coastwise from London	50,000 ,,
Per rail from Liverpool................	10,000 ,,
	628,000
Deduct estimated stock in all hands	90,000 ,,
Quantity consumed......	538,000 qrs.

Or an average consumption of upwards of 10,000 qrs. per week. Black Sea (upon which description our quotations are based) was quoted at 51s. per qr. for old and 52s. to 52s. 6d. for new; during the months of January and February the arrivals were unusually heavy, averaging 13,000 qrs. weekly; notwithstanding, the market sustained itself well through this period; during March the arrivals were limited, with a steady market until the beginning of April, when large arrivals took place, and prices declined about 2s. per qr. The downward tendency continued to the end of the month, when a sudden and unexpected rise of 3s. to 4s. ensued, through the unsettled state of political affairs; this, however, did not last long, a speedy decline of 1s. to 2s. followed, and at the end of May (when the crushing season may be considered as over) 50s. was the nearest price on the spot. During the month of June the arrivals were to a seasonable extent, but the crushing trade being at a low ebb, our mills were only very partially at work, and the imports went chiefly to warehouse; this state of things continued for another month, and at the close of July the price had receded to 46s. 6d. At the beginning of August supplies came forward more freely, and the mills resumed work: prices were steady throughout the month at 46s. to 47s., and gradually declined, with a very large import, to 45s. to 45s. 6d. during September. Liberal arrivals followed both from the Baltic and Black Sea; several cargoes of the latter description were sold at 44s. 6d. to 44s., being the lowest price attained during the year. The market now being cleared of floating cargoes on the coast, and the period being at hand for the closing of the navigation in the Baltic, crushers were more disposed to augment their stocks, and more especially so with an improved demand for Cake, and a better prospect forward for both Oil and Cake. Before the close of November 47s. 6d. and 48s. was paid; since which a further gradual improvement has taken place, and sales have been made at 49s. to 49s. 6d. The late severe weather has given an impetus to the demand for ordinary qualities of all sorts, and importers have been enabled to realize an advance of 3s. to 5s., ex warehouse, from the lowest point. During the present year our crushers have more than ever restricted themselves to the purchase of seed on arrival, choosing this course in preference to importing; this applies more particularly to imports from the Black Sea and Azoff, the qualities of which have so often proved unsatisfactory; the present season has been no exception to the rule in that respect, and the arrivals are not calculated to inspire buyers with more confidence for the future; no seed has proved more disappointing than Archangel, the quality of which has been much under average of late years' shipments, while the Petersburg Linseed has ranked decidedly better in quality than usual. Black Sea is quotable at 49s. 9d. to 50s., Petersburg fine 47s. to 48s. 6d., ordinary 36s. to 45s.; East India 50s., to 54s., Riga 26s. to 44s. per qr.

LINSEED OIL.—The quotations on the 1st January was 29s. 3d. per cwt. For the first three months of the year the market remained steady, at no time varying more than about 3d.; in April it declined to 28s. to 28s. 3d., immediately afterwards advanced to 29s. 6d. for a few days, from political causes, and then again fell back to 28s. 6d. to 28s. 3d.; on the 30th June it stood at 28s., and continued during the next three months with slight fluctuation. October opened at 28s., with a large production and a declining tendency. Early in November business done at 27s. to 27s. 3d., and these rates steadily maintained after that period to the close of the year. The export amounts to 14,754 tons, and although not quite equal to last year, which was 15,348 tons. The shipments to London, for the French and Mediterranean ports, are this year 5,918 tons. The stocks are unusually low. The trade of the year has been less speculative in its character than usual, and the demand has been chiefly based upon consumption. The duty in all ports of the Zollverein will be reduced £2 16s. per ton on the 1st January, 1860.

LINSEED CAKES.—The make of English cakes has been this year on an unusually extended scale in this quarter, still not more so than sufficed to meet a demand which seldom left any in the hands of crushers. The year commenced with prices at £9 5s. to £9 7s. 6d. per ton for Hull makes; continued thereat up to the end of March; during April declined about 10s.; in May £8 15s. to £9 their value; and before the end of June £8 10s. was accepted; prices remained thereat during July, August, and September; with the conviction that unprecedented supplies would come forward, and low prices range, crushers sold freely; during the month of October £8 5s. was accepted, and in some instances £8 2s. 6d.; forward contracts were also made up to March and April next, at prices varying from £8 10s. to £8 15s. About the middle of November the altered state of the seed market caused our crushers to take a stand for higher prices, and before the close of the month £9 was paid; severe weather in December brought buyers forward freely, and stocks, which, since the commencement of the season, have never been large, are well cleared at £9 2s. 6d. to £9 7s. 6d., and in some instances £9 10s. paid for approved makes.

RAPESEED.—The import this year is about double that of 1858, being respectively 23,574 qrs. and 45,013 qrs., the largest portion of which consists of Rübsen, which came in in July, and brought 46s. to 47s. per qr. The growth of this kind of seed on the continent has almost superseded that of rape. Up to September but little rape appeared on the market, when the value was quoted 52s. per qr. In November prices reached 54s., and at the end of the year 56s. was paid for fine quality. The stocks are small of both sorts of seed, the crushers being the only holders, as they were almost the only importers during the year.

RAPE OIL.—The business passing, like that of last year, has been entirely a consumptive one. The opening price for brown was 43s. 6d., and pale 47s. per cwt., which fell in the spring months to 40s and 43s. respectively, but maintained its value until June, when a decline commenced which continued to the beginning of November, when it reached 32s. 6d. for brown, after which the price advanced to 36s. 6d. for brown, and 39s. for pale, at which the year closes. The import of foreign has been insignificant.

RAPE CAKES.—The value of this article, in consequence of the short supply, advanced from £6 5s. in the beginning of the year for feeding, to £7 in February, which was the highest price reached. The result was a limited demand, and a decline of prices to £5 17s. 6d. to £6 in April or May; after which they gradually receded to £5 in July, at which rate they continued for some months, when more liberal supplies from the continent and a large import of seed brought the value to 92s. 6d. for both English and foreign best feeding qualities. The year closes at 95s. to 100s. for feeding, and 80s. to 85s. for manures.

FLAX.—The total import of flax into Hull during the year from the various countries amounts to 13,695 tons, against 17,913 tons in 1858, and 19,459 tons in 1857; and of tow and codilla 3,937 tons, against 3,252 tons and 3,381 tons in the two previous years. It will be remarked the reduced imports of flax at this port are chiefly from Riga, Petersburg, and Holland. The stocks of flax at the close of 1858 were greatly reduced, chiefly owing to the large export of the article from Hull (and the Scotch flax ports) to France and Belgium. The year opened with great firmness, and during the months of January and February a decided rise in value took place. Prices in Russia greatly advanced, and were nearly equal to those paying by the spinners in this country, which, however, checked contract business for spring delivery. In March the spinners began to restrict their stocks, in consequence of the high prices and the unremunerative rates obtained for yarns. The trade remained in a very inanimate and unsatisfactory condition for the next two or three months, the stocks being nearly swept off, while the uncertain aspect of continental politics induced great caution in the buyers, under the influence of which the holders were compelled to lower their demands. In July the expected peace reassured the trade, and somewhat strengthened the position of the holders. The previous reduction in prices induced the spinners to buy more freely, and a fair demand showed itself for all descriptions of flax, prices being now from £3 to £4 per ton below the opening rates of the year. In August a large business was done, and in some cases the holders obtained rather higher rates, the trade assuming a firmer aspect. September brought less animated markets, a quiet feeling prevailed, and prices were barely maintained. In October business continued on a limited scale, prices receding further £1 to £2 per ton. November opened with rather more inquiry, and the spinners became anxious under the indications of an early winter in Russia. The prices abroad began to fall, and the leading Scotch spinners in particular took largely of the fresh flax brought down to Riga. December commenced with quiet markets; and holders, even of the best kinds, which generally through the year have been the most saleable, evince more disposition to sell. The trade leaves off in a healthy state, the stocks are in a limited compass, and we anticipate, with reduced prices and the more favourable prospect of the settlement of political difficulties on the continent, a good steady consumptive demand during the coming season.

HEMP.—The import of this article into our port from Russia this year is much the same as last, viz., 4,023 tons, against 4,159 tons last year. The anticipation at the close of last year of increased consumption in consequence of the relatively high price of flax, has not been realized, spinners having given the preference to Italian hemp, of which consumption has been very large. The extreme hardness and coarseness of the hemp shipped at Riga the past season has proved a barrier to its use, even for usual purposes; this combined with a good supply of clean of fair quality has enabled the large ropers to obtain their supplies at below import cost. The price of clean at the opening of the year was £31 to £31 10s. per ton, and closes at £28, its present value. Consumers are looking for a low range of prices for the article during the coming season.

OLIVE OIL.—The import this year has been 5,200 tons, against 4,400 tons in 1858, 3,410 in 1857, and 4,920 in 1856. The market ruled steady from £50 to £48 per tun, with very trifling variation in price till Midsummer, reports then came to hand of failing crops, prices gradually advanced, and when in November those reports became confirmed, the price suddenly jumped up £5 to £6 per tun, and £57 may now be quoted the nearest value for Gallipoli; and as the imports barely keep pace with the consumption, there is every appearance of prices being maintained. Prices would have advanced still higher but for the fact of an unusually large supply of rape oil.

CATTLE BONES.—The range of prices during the year has been moderate; at the close of last year best quality fetched £5 10s. to £5 12s. 6d., and in consequence of small imports the value went up to £6—the highest during the season—after which a gradual decline took place up to the end of the year, which closes with best sorts at £5 5s., and South American £4 15s. The import of bones and bone ash, fortunately for the agriculturist, has been considerably increased from South America, whilst supplies from the continent annually fall off, owing to the increasing use of them on their own soil. The import this year is 12,381 tons, inclusive of bone ash, of which we have had 4,618 tons. Stocks of both are moderate, and may be taken at about 3,000 tons. The import of guano has been small during the year, and prices barely sustained.

TAR.—The year began with small stocks, which, as the season drew on, became quite exhausted before fresh supplies came to hand; and these coming very sparingly forward, there was a steady progressive increase in the price, which, opening at 15s. on first sales in the latter part of June, when the imports of Stockholm commenced, closed at 18s. 6d. towards the end of the season for the last arrived shipments, being an increase of 3s. 6d. per barrel upon the highest price reached last year for this article. The total imports from all parts, including about 2,650 barrels from Archangel, with oddments from Hamburg and America, reach about 21,870 barrels, against 26,810 and 17,527 barrels in 1857 and 1858 respectively. There are only comparatively small stocks, and these almost exclusively in second hands, held over on the spot, a great portion of the imports having been disposed of at a distance.

COAL.—The exports are this year 143,883 tons, and in 1858, 128,873 tons, showing an increase in 1859 of 15,010 tons. In SALT there has been a slight decrease during the year, considerable quantities of both these articles being shipped from Grimsby, where the charges are lower.

IRON.—The import this year exceeds the last by upwards of 12,000 tons, being respectively 19,409 and 32,342 tons. As with most of the imported raw materials, a large business has been done at a small profit to both merchant and manufacturer; and with considerable stocks on hand, but little prospect is held out for further imports. Prices have not undergone any material change during the year, which closes with Russian K. B. at £17 and Swedish at £12 per ton.

SHIPPING.—More business has been doing during the present year than in 1858, but the result has not been satisfactory to the British shipowner. Quebec freights opened at 30s. per load, and the lower American ports at 75s. to 80s. per std., which rates were not exceeded except for a few ships fixed late in the season. From the Baltic, &c., the spring freights were extremely low, but as the season advanced better rates were obtained, particularly from the Gulf of Bothnia, which trade has now become of very great importance here. The value of tonnage has just experienced an advance, and the prospect for the future is a little more hopeful; but for the permanent welfare of this important interest, it is held by our shipowners to be absolutely necessary that inquiry be immediately made into the causes of the present depressed state of the shipping in this country, with a view to the adoption of all necessary measures of relief.

P. BRUCE,
Secretary to the Hull Chamber of Commerce.

ANNUAL REPORT OF THE LIVERPOOL WOOL TRADE.

LIVERPOOL, December 31st, 1859.—It is our pleasing task to be able to report favourably of the Wool Trade generally throughout the past year.

The great falling off in the exports of manufactures during the panic, created, no doubt, a vacuum that required filling up; but when we find the increase to have been such as even to exceed the hitherto largest shipments of 1857, we very naturally ask whether any new markets have been opened to us, or is this solely to be attributed to a greater development of existing channels arising from the fact that a more extended commerce, as a matter of course, brings about a larger demand for our productions in return? We rather incline to the latter view, and since a brisk export trade always materially contributes to the full and steady employment of our home population, who in their turn become not only larger consumers of all the necessaries of life, but even of the so-called luxuries, we may thus account for the very large home demand for all kinds of woollen goods that has prevailed during the year.

With regard to the raw material, we alluded in our last annual circular to the unprecedented panic as having necessarily limited the consumption, but that even under these circumstances stocks were found not much in excess of the demand, and we expressed the opinion that with the return of prosperity prices would in the ordinary course of events not only be well maintained, but even enhanced; and this would, no doubt, have been the case, had not political affairs on the Continent taken such an unlooked for turn in the early part of the year, inducing all to act with extreme caution, and deterring foreigners to a certain extent from taking their usual supplies from our markets: this continued up to clip-time, when consumers being much lower in stock than was anticipated, showed great anxiety to supply themselves at the opening rates from growers, and, competing very keenly, forced prices up in a few weeks to within a shade of the highest point attained before the panic, and at these rates a large portion of the clip was disposed of. Continental affairs again becoming very unsettled, the trade was once more induced to act with great caution, and though probably no material decrease in the consumption took place, still all needy holders, in order to effect sales, had to submit to a reduction of from 2½ to 5 per cent., which state of things continued up to the end of October, when, with an increased steadiness of consumption, prices recovered their former range, and the year closes very firmly at the same.

The imports of foreign and colonial wools, in the aggregate, amount to more than in the preceding year, and are about equal to those of 1857.

Australian.—The import for the year shows a small increase on the previous one, and the condition has on the whole been fair; New Zealand showing the greatest improvement, and the enhanced prices obtained in consequence will be an incentive to the grower for further exertions. The first series of public sales in London began on the 24th February, and terminated on the 17th March, and consisted of 35,204 bales, of which 16,107 bales were Cape, about the same quantity as the corresponding sale of the former year; it was generally expected that these would go off at an advance on last sale-rates, but the unsettled aspect of political matters on the Continent at this period induced foreign as well as domestic buyers to act with great caution, and the rates of the previous sales were not quite maintained, except for the very best descriptions. The second series lasted from the 5th May to the 3rd June, consisting of 62,293 bales, of which 6,153 bales were Capes. Political affairs being still very unsettled, the general result was a fall of from 2d. to 3d. on Colonial and 1d. per lb. on Capes. The third series, commencing on the 21st July and closing on the 30th August, comprised 89,202 bales, of which 14,144 bales were Capes; the unexpected proclamation of peace, together with the prospects of an abundant harvest and the cheapness of money, all contributed to inspire confidence, and the late reduction of 2d. to 3d. per lb. on Colonial and 1d. per lb. on Capes was fully recovered, and the total quantity sold with spirit. The fourth and last series commenced on the 10th November, and terminating on the 7th December, consisted of 47,234 bales, of which 20,098 bales were Capes; there was less competition by foreigners than usual, but former rates were fully maintained, and in the case of Port Philip fleece an advance of 1d. per lb. was established.

Cape of Good Hope.—The decrease in the import will be found considerable. There is a very great improvement in the getting up of some of the flocks, which have sold at very high prices, thus proving, as regards some districts at any rate, that it only requires care and attention to produce a better class than the hitherto general imports from that quarter, and it is to be hoped the satisfactory prices realised for these well-conditioned parcels will induce other growers to follow the good example. There have been reports of late of very great losses in the flocks from drought, but we hope they may be found to be exaggerated, for besides entailing a heavy loss to the settler, it would check the supply, which is not more than sufficient to satisfy the general wants.

German.—The import has been much larger than in former years. In the early part of the year, owing to the high prices of colonial wool and the very unsettled state of political affairs on the Continent, many holders there were anxious sellers, and some considerable parcels were bought for this country at very low rates.

Spain and Portugal.—The supply of the former has been very limited, and every succeeding year seems to indicate that it will cease altogether. Oporto shows a large increase. The demand for washed is partly governed by the prices of English combing wool, and as these have been steady for some time, there has been a fair demand for this description during the last six months.

United States.—There have been no imports of the growth of this country during the past year; and now that trade has, since the panic, regained its natural channels, their manufacturers require, in addition to their home growth, a large supply of fine wools from all countries where they can procure it at under 20 cents per lb., this being the duty-free price.

Buenos Ayres.—The imports show a falling off. The demand throughout the year has been fair; and the best-managed flocks usually imported here have met with ready sale, and to a certain extent our demand fluctuates with that for colonial wools. The middling and inferior classes of both washed and unwashed Mestizo have been less inquired for, and consequently heavy of sale: still, we close the year with a very light stock. Cordova has been in fair request throughout the year; and the market is now quite bare.

Peruvian and Alpaca.—The arrivals of sheep's wool show a very large increase. In the beginning of the year the demand was very trifling, except for the better qualities, but afterwards greater activity was experienced, and the market has not only been cleared of all old stocks, but late arrivels have been eagerly competed for at full rates. The import of Alpaca has also increased. The year opened with a considerable stock and a sluggish demand, which continued up to June, when a better inquiry manifested itself, and before the end of August the market was cleared of all that holders were disposed to sell at a market price, as well as of considerable quantities to arrive. The stock now left is only about 2,000 to 3,000 ballots, which are held for higher rates.

East India.—The imports this year show a slight decrease, as compared with the two former years, which does not arise entirely from a diminished supply, but from the circumstance that, instead of England receiving, as hitherto, nearly the whole export from Bombay, a portion is now sent direct to the United States, France, and Germany. The demand throughout the year has been very steady, and prices have ruled more uniformly than during the previous year; but we regret to find that less care is taken in the packing of these wools than formerly, some marks showing a considerable portion of *country damaged* wool, and appearing also to have been press-packed while damp. To this we would especially call the attention of shippers, as it will prejudice the sale generally very much. While noticing these defects, which require guarding against, it is on the other hand gratifying to acknowledge that there have been several small shipments, with fair length of staple, that were well got up; these attracted great attention, were eagerly competed for, and realized such prices as we hope may stimulate shippers to extended improvements.

China has met with fair inquiry, the imports continue light.

Russia.—The imports have slightly increased. The demand for Donskoi fleece has only been moderate, and the prices of good qualities have not varied much, but middle and inferior parcels have fluctuated both in demand and value to a greater extent; the stocks at present, however, are but light. Lambs and Autumns have been in good request, and the market is quite bare.

Mediterranean.—A slight increase in the arrivals is to be noticed, but the demand has not been good, and they can hardly have paid the importers.

Egyptian has been much sought after during the year, at relatively high prices, and we are glad to perceive a very great improvement in the getting-up of these wools, in consequence of which the better classes have commanded very full rates.

Turkey Goats' or Mohair.—During the first few months of the year we had a rather limited and unsteady demand, with but light stocks; however, by June, when small parcels begin to arrive, they were picked up at from 2s. 3d. to 2s. 6d., and in a very short time prices were run up to 3s., and have since then kept steady at about this figure.

Iceland shows a little falling off in the arrivals. The demand has been regular and steady, and prices have not varied much. Stocks are now reduced to a very narrow compass.

Barbary calls for no remarks, there having been no receipts, as the Emperor of Morócco has continued to prohibit up till lately the export of the article, but we now look forward for fresh arrivals.

Domestic Wools have been chiefly treated on in our general remarks, which will equally apply to Irish also, which are nearly all cleared out of farmers' hands, and prices rule now higher than for a great many years past. Scotch: Laid Cheviot of a light, clean, and good class met with ready sale at clip time, at very high rates, and farmers sold freely; since then the demand has been sluggish, and, although the consumption has been large, prices have not been well supported. Laid Highland has been in limited request, and there was less sold at clip time than usual; since then farmers have been more desirous of meeting the market, and prices have given way from 5 to 10 per cent. There has been so little doing in this market lately, that our quotations must be considered nominal.

Sheepskins have been much sought after throughout the year, and the better qualities of heavily woolled have commanded high rates, though lower classes of Mestizo are less eagerly competed for.—Hughes and Ronald.

ANNUAL REPORT OF THE LINSEED, OIL, AND CAKE TRADE.

Sir,—Last year was marked by so few incidents to call for more than a passing notice, that we fear our annual circular will again be deficient in interest, except in showing that of late the business has been more remunerative to crushers than for some time previously, and a lower range of prices having been established abroad, we hope the healthier tone of our trade will continue, and no cause of complaint remain either to importer or manufacturer. The import and prices have closely followed the expectation we expressed in our last; the present statistical accounts have also been compiled with great care, and are worthy your considerate attention. The retrospect likewise will be found useful, as showing how much prices depend now-a-days almost upon supply alone. The demand having so increased of late as to be out of all proportion to former years, besides which, being continuous, and still to a great extent free from speculation, our wants are very regular, and prices are chiefly governed by temporary excess or absence of supplies.

LINSEED.—At the commencement of the year, the value of Black Sea seed was 52s. 6d., and allowance being made for slight differences in quality, it scarcely varied a sixpence during the first three months. It was dearest in January, when stocks were light; but after February, during which month the arrivals were free, the value was with difficulty maintained; and when March brought with it new arrivals and mild weather, the price relapsed to 49s. by the end of the month. In April, large arrivals sent the value to 47s., at which price the coast was cleared, partly for home consumption, and some for export. At the close of this month, war between Austria and France ensued, and the rumour of a secret alliance between Russia and France was promulgated, causing our market to be very excited, and sales were made at an advance of 6s. per qr. in about as many days, 53s. having been paid for a considerable quantity. The sales at this time were principally from granary; holders, who had during the previous few weeks endeavoured to stop the decline by landing and withdrawing their seed from the market, now gladly taking advantage of the rise to get out of stock. The excitement was but momentary, however; for, doubts having been started as to the truth of the alleged secret treaty, a great absence of transactions followed, and prices dwindled almost imperceptibly during May and June, by the end of which latter month the value had fallen to 49s. In July the market was flat, and new arrivals off the coast made the tendency very heavy, so that a further fall of 3s. 6d. per qr. was established. All the cargoes then offering were cleared at 47s. to 46s. 6d.; and, pending new arrivals, the price was quoted 48s. again by the middle of August. It was only a nominal value, however, for, arrivals quickly succeeding, the price returned to 46s. 6d. Further heavy importations in September reduced the figure to 45s., and even thereat (although the margin for working at this time was unusually profitable) the disposition of buyers to operate only from "hand to mouth" made sales difficult to effect. The same same may be said of the month of October; and in this month we have to mark the lowest price, namely, 43s. 6d., at which some cargoes were taken off the market, and landed on speculation. November brought with it diminished supplies, and those who had neglected to purchase on the flat markets, now that they were driven to buy, found seed less plentiful than they had expected, and a rapid rise occurred of 5s. per qr. Early in December fresh heavy arrivals momentarily checked the rise; but a growing belief that the supplies will run short during the spring months has further slightly enhanced the value, and the market is firm to-day at 49s. for seed on the spot, with buyers at 50s. for cargoes expected next month. Throughout the year the amount of business done previous to arrival has been of the most limited character; only very seldom has it happened that buyers have been found willing to operate. When, however, such has been the case, it has generally been at about 1s. per qr. above the price offered for parcels at hand.

Notwithstanding 800,000 qrs. have been imported within six months, stocks are barely equal to those held at this time last year; and in addition to this fact (if our estimate prove right) we may calculate on a comparative deficiency of 100,000 qrs. during these first six months of 1860. The accounts of the late crops are so various as to prevent our forming any reasonable conclusion regarding the quantities we may expect for next season's use (1860-61), but we incline to the belief that they will prove short of the past two years' supplies.

Bombay seed maintains its very high character. Calcutta has fallen off, partly through the country damage sustained this season before shipment, and likewise through the reprehensible system of admixture common to Black Sea and some Baltic shipments. Morshansky has been the best for many years—Archangel the worst. Black Sea *lin*seed is as good as ever; but whilst the obnoxious system of adulteration is carried on through the admixture of 12 per cent. to 20 per cent. of extraneous matter, we need not be surprised at the incessant complaints expressed regarding it. Until lately, we did get an occasional unmixed cargo, but now *all* the importers find it so much to their interest to follow the *common* mode of shipment, that it is merely a difference of degree. The hourly complaints of the linseed oil made in the present day, show the extent of the deterioration caused by the admixture of wild rapeseed, &c. We really think the remedy, however, is in the crushers' own hands. Merchants cannot but be desirous to bring the seed in its genuine state if it paid them even only equally well to do so; but they carry on their business for profit; and if they find it more to their advantage to bring it as it now comes, owing to buyers not paying an adequately higher rate for unmixed seed, why of course they will continue so to do. The conditions also enforced by sellers in the lately established forms of contract for Black Sea cargoes, will help to increase rather than mitigate the evil, and there is no reason why by-and-bye we should not see Azov seed scarcely distinguished from Rjeff or low Wiasma, and it is to be hoped it will by that time bear a relative value, as it has already shown signs of doing compared with the best East India descriptions. Unless, also, some decided steps are taken, it is not improbable Calcutta seed will presently come equally changed in its character. It simply requires that the better articles should be saleable at an equally remunerative rate to the inferior, and the disease would remedy itself. We should be only too glad to see some new arrangement come to between buyers and sellers to bring about so desirable a result, and we would gladly personally do everything in our power, either in the device or carrying out of a scheme, to obviate the evil complained of. It is really deplorable that it should be found commercially necessary to deteriorate a really good growth of linseed by foul admixtures.

In Granary we have about 35,000 qrs., namely, 11,500 qrs. Black Sea, 1,000 qrs. Petersburg, and 22,500 qrs. East India, beside which about 20,000 qrs. have been lately reported, but are not yet discharged from import ships. At Hull there are 55,000 qrs., and there is said to be 45,000 qrs. in crushers' hands, including what is afloat in the port. At Liverpool about 20,000 qrs. are held by importers. Off the coast there are 40,000 qrs. ordered, but not yet arrived at their destinations, and in addition 185,000 qrs. expected within the ensuing three months, 70,000 qrs. of which are Black Sea, 86,000 qrs. Calcutta, and 29,000 Bombay, or in all about 100,000 qrs. less than at same time last year.

The import into London is again greatly in excess, and stocks being only about the same as last January, whilst the export has been considerably less, proves that the consumption drawn from this district must have been nearly double that of the previous year. Subjoined are the respective annual official returns of the aggregate imports into the United Kingdom:—

1841	363,461 qrs.	1851	630,471 qrs.
1842	367,700	1852	799,402
1843	470,539	1853	1,035,335
1844	616,947	1854	828,513
1845	656,793	1855	756,950
1846	506,141	1856	1,180,179
1847	439,512	1857	1,051,113
1848	799,650	1858	1,017,844
1849	626,495	1859 about	1,250,000
1850	608,984		

The casualties at sea have been unusually heavy, 40,000 qrs. having been lost, but for which our import would have been at least 1,300,000 qrs.

To this port the East Indies last year supplied nearly 350,000 qrs., the Black Sea about 35,000 qrs., and the remainder was made up of cotchels from the Baltic, Archangel, Alexandria, &c. The direct re-export from England amounts only to about 90,000 qrs. against 150,000 qrs. in 1858, and 30,000 qrs. in 1857.

The aggregate into the United Kingdom is made up of about 300,000 qrs. from Bombay, 250,000 qrs. from Calcutta, 135,000 qrs. from Petersburg, 41,000 qrs. from Archangel, 90,000 qrs. from Riga (including 21,000 qrs. sowing seed), 40,000 qrs. lower Baltic ports, and remainder made up of Alexandrian and other Mediterranean ports and sundries.

The Black Sea cargoes calling at Falmouth for orders, consisted of about half-a-million quarters, which were discharged as follows:—Hull, 229,700 qrs.; London, 33,350; Grimsby, 31,550; Ipswich, 18,950; Lynn, 12,200; Liverpool, 11,400; Boston, 10,100; Southampton, 9,000; Newcastle, 8,900; Yarmouth, 7,600; Gloucester, 5,300; Dublin, 5,150; Lowestoft, 4,550; Dover, 3,650; Leith, 2,650; Rochester, 1,900; 77,800 quarters went to Antwerp; 12,150 to Amsterdam; 6,800 to Ghent; 3,100 to Rotterdam; 1,550 to Termonde; 1,200 to Delft; and 1,200 to Bruges.

The direct export from the north of Russia to continental ports has been in excess of 1858, and consisted of about 20,000 qrs. from Petersburg, 16,000 qrs. from Archangel, 54,000 qrs. from Riga, and about a similar quantity from Memel, Konigsberg, &c., also 62,500 qrs. of sowing seed from Riga.

LINSEED OIL has, throughout the year, been in excellent demand; but the supply has been so large, and holders so unwilling to hold stock in the face of the daily increasing manufacture of the article, that, although prices have been fairly sustained, the value has steadily (excepting a momentary interval at the end of April) declined, and marks nearly as low to-day as at any date since our last. In January the price was £30 to £29, in February almost £30. During March it declined below £29, whilst in April it receded to nearly £28; but the political rumours which at this time influenced seed influenced it also, and £31 was once paid. Before the end of May £28 10s. was with difficulty obtained, but in June a moderate American demand kept it firm at that price, and during July, August, and September, it scarcely varied 5s. per ton, occasionally a large business doing, and sometimes a very flat market, at about £28 10s. In October a diminished export trade (which until now had taken off all the surplus oil) had the effect of reducing the price to £27, when numerous speculative forward purchases, at about 20s. per ton advance over the spot price, caused a reaction to £28; but, the inquiry for future deliveries ceasing, the market has since relapsed to £27 10s., and during all last month was not easy of sale thereat. The probable prices of seed should keep the value at least at its present quotation; but unless the export inquiry is renewed, and continued at an undiminished rate, stocks must accumulate, for the home trade alone would not be able to take off the quantity made. France and Italy have again taken an unusual quantity, and the export is the largest ever known, namely, as nearly as possible 30,000 tons, against 26,000 tons in 1858, 16,250 tons in 1857, 28,000 tons in 1856, and 17,500 tons in 1855. To-day the demand is somewhat better, and oil with difficulty obtained at £27 10s.

LINSEED CAKES.—There was a steady trade during the early months of last year, with scarcely any fluctuation in the value, town-made ruling at £9 15s. from January to April. Early in May the improved tone in the wheat market caused a rise to £10, which, however, was not maintained, and in June £9 15s. was again the value; since this, we have gradually receded to £9 5s., and have a good demand to-day thereat.

Of foreign, the import into the United Kingdom will be about 10 per cent. in excess of 1858. As with English, there was very little alteration in value during the first four months of the year, prices being £9 15s. New York bags, and £10 2s. 6d barrels; but early in May, influenced by the causes above mentioned, prices improved to £10 10s. for barrels, and £10 to £10 5s. for bags. The rise speedily brought about a reaction, assisted by heavy arrivals in June, and prices then touched £9 5s. for bags—£9 15s. barrels; these rates, with scarcely any variation, have been ruling to the present time, and to-day our quotation for barrels is £9 15s., and bags £9 5s. Square Marseilles is £8 5s. c. f. & i., which has been about the average quotation throughout the year for this description. Our stocks are unusually light, with a meagre prospect of supply, that any cause bringing about an increased demand will probably enhance the value to the corresponding periods of last year.

RAPESEED AND OTHER OIL SEEDS.—The import is enormous, and double that of even the large quantity of the previous year; all the excess, however, namely, nearly 200,000 qrs., has been re-shipped to various continental ports, but large stocks are still held, and about 60,000 qrs. rape and 25,000 qrs. of other oil seeds remain in warehouse. Afloat there is less than usual, say under 50,000 qrs. of all descriptions. Calcutta rapeseed ranged from 53s. to 40s., and then steadily up again to about 45s., which is its present value. Fine Bombay is 55s.; poppy seed, 46s.; Niger seed, 36s.; Teel, Sessame, Sursee, and Gingelly, 45s. to 50s., according to quality, all being lower quotations than those of last year.

RAPE OIL continues to increase in consumption, and the range of prices has greatly assimilated to that of 1858, namely, 39s. to 48s. for foreign refined oil. The make of English oil has also been greater than formerly, and we are glad to note that the prejudices which existed against it are gradually dying away, and it goes into consumption freely at a difference of about 2s. 6d. per cwt. below the rates for foreign oil. The value has steadily receded since January last from 48s. to 40s., the latter being our quotation to-day.

RAPE CAKES, owing to the large import of rapeseed, have been in great supply; the price opened at about £5 5s. for English, and remained thereat until July; it has since dropped to £4 to £4 10s., with a fair demand. Foreign have been in very short supply, and have ruled at about 10s. to 15s. above town-made.

TALLOW.—The ordinary principles which govern the price of articles of commerce, namely, the question of supply and demand, seem to have forsaken this article, and the market is so ruled by purely speculative operations, that it is beyond our province to attempt to follow its various ramifications. The value has ranged from 51s. to 60s, 57s. 6d. being to-day's price, and, owing to the artificially high rates maintained, the consumption has fallen off about 25 per cent. since June last. EDWARDS, EASTTY AND CO.

London, Jan. 2.

THE LEATHER TRADE IN 1859.

In taking a review of the Leather Market for the past year, we have to remark, as one of its most striking features, a gradual and steady recovery from the effects of the late panic. Month by month we have had to record increased firmness as respects prices, without adequate supplies of many articles to meet the requirements of the trade. The war, which broke out on the Continent early in the year, gave an additional impetus to trade, and large quantities of hides, as well as leather, were required for army purposes. The value of hides became considerably enhanced, which induced tanners to operate with caution, and a diminished manufacture resulted, so that no accumulation of stock has arisen. The bulk of leather imported is about the same as during previous years, but consists chiefly of tanned East India kips, which have been in very large supply; a considerable number, however, have been exported to America; so that our receipts from other parts have fallen off, which may be attributed to the large requirements on the Continent for their respective armies. The leather trade may therefore be regarded as in a sound and satisfactory condition, with every prospect that present prices will be sustained. Our own opinion would tend rather to a reduction in the value of the raw material, than to any further advance upon the manufactured article; and we think the attention of tanners should be directed to that object. At Leadenhall, yesterday, there was a very short supply of fresh goods, with a lively demand for nearly all descriptions at full prices.

CROPS.—We have had a better trade for nearly all descriptions.

BUTTS.—There has been a moderate supply of most kinds of English, with a large business doing, especially in medium and inferior, at former prices, leaving only a limited stock on hand. Those of 28lbs. each and upwards are much in request at firm rates. In foreign the demand during the month was active.

OFFAL.—English of all sorts has met a good demand without alteration. Foreign continues scarce, particularly as regards common qualities. English shoulders are also in scanty supply, and generally sell on arrival; heavy are much wanted. Foreign remain unaltered.

DRESSING HIDES.—Supplies have continued large for the season. The sales also were generally extensive, particularly of the lower qualities. Averages from 28lbs. to 33lbs. each, well flayed, met a good demand. Prime heavy harness 38lbs. and upwards are inquired for. The stock of shaved hides has decreased, and a fair business prevails at former rates, light 20lbs. and under being chiefly wanted.

HORSE HIDES.—English are scarce, and sell freely at full prices. Spanish continue without alteration.

CALF SKINS.—We are still sparingly supplied with all descriptions, and the demand is active for those 56lbs. per dozen and under, at full prices. Heavy are also in request, particularly when averaging 75lbs. per dozen and upwards, with few left on the market.

KIPS.—Trade for this article has improved since our last, especially for best qualities of East India from 5 to 8 lbs. each; there is also more attention to inferior. Petersburg are still scarce and inquired for.

BASILS continue in fair request at former rates.

CURRIED GOODS.—There is hardly any alteration or improvement in this branch of business since our last. Scotch middlings of good quality, if bright and clean on the grain, are particularly inquired for, but secondary and inferior are plentiful and difficult to move; nor is there much doing in shoe butts. Supplies of kip butts have been equal to the demand, with the exception of prime, which are scarce and wanted. Good light skins 18 to 20 lbs. per dozen, thin grain, and heavy harness hides are in request.

FOREIGN LEATHER.—We continue to receive small quantities of Swiss and French calf and Belgian russet shoe hides. Australian hides and sides are in request at our quotations. Oporto leather has been more inquired for. North American is in short supply, with only a moderate demand.

FOREIGN RAW GOODS.—A steady trade has prevailed, and prices are firm for all descriptions of hides. The import of salted River Plate and Rio Grande hides during the past year has been 230,812 against 156,000 in 1858. Stock 29,750. Import of dry 13,300, and stock 5,448. Import of Australian 257,421 against 174,386 in 1858. Stock 10,066; these hides are more in repute, especially the best cured from Sydney. Cape hides of all kinds sell freely; the import has been 33,781 hides, and 10,013 kips and skins against 77,000 in 1858, and 145,000 in 1857, showing a material falling off in the supply. Of West Coast, Brazil, and West India, the import has been 29,703, against 52,800 in 1858. South American horse hides are not much in request at present rates; the import has been 119,518 against 101,000 in 1858. Stock 41,800. East India kips at recent sales moved off briskly at rather improved rates; the import 2,779,817 and 91,904 buffalo, against 2,379,256 in 1858; stock 657,000; the quantity afloat is reported to be about 250,000. Petersburg kips are in small supply, and firm.

THE IMPORTS last month were 3,134 salted River Plate, 888 New South Wales (and upwards of 37,000 yesterday), and 2,216 Cape hides; 1,755 salted and 4,240 dry South American horse-hides; and about 414,776 East India and buffalo hides.

THE PRINCIPAL SALES include 11,503 salted River Plate ox and cow hides; heavy and light 8¼d. to 8½d. per lb.; 33,192 New South Wales hides; heavy 5¼d. to 5¾d., light 4⅞d. to 5¼d., and seconds 4d. to 4½d. per lb.; 4,401 Cape hides, kips and skins, best heavy 7d. to 7½d., seconds 5½d. to 6d. light; best 6½d. to 7d., seconds 5d. to 5½d., and thirds 4d. to 4½d. per lb.; kips, best 8d. to 9½d., seconds 6½d. to 7d., and skins 6½d. to 7d. per lb., and about 192,000 East India kips; best light drysalted 13d. to 14¼d., seconds 10½d. to 11½d., heavy 10d. to 10½d., seconds 8d. to 8¾d., and thirds 6½d. to 7d. per lb.; brined, best light 13½d. to 15d., seconds 11d. to 12½d., and thirds 7½d. to 9d. per lb.

BARK.—More inquiry prevails for good samples, which are not plentiful. No import.

VALONIA.—Import 350 tons. The transactions have not been extensive, and being restricted to small parcels for present consumption, quotations remain unchanged.

TERRA JAPONICA.—Import 557 tons. A considerable business has been effected during the month at slightly advanced rates. The stock on hand is large.

DIVI DIVI.—No import. Sales 45 bags damaged at 12s. 6d. per cwt. Myrabolams have sold at a slight advance. Import 212 bags.

MARKET HIDES have been in large supply; best heavy met a good inquiry at late rates; inferior and light have rather receded in value. There is no alteration in cow hides and calf skins. Horse hides have advanced 1s. each.

LIVERPOOL LEATHER MARKET.—Until nearly the close of the past month the demand continued languid, which is usual at the end of the year. Within the last few days more activity has prevailed, and a good trade may be anticipated during January, as buyers generally are known to have only small stocks. Butts and bends suitable for straps are extremely scarce; other kinds continue in fair request, and prices have an upward tendency. Heavy crops meet ready sale with only a short supply; for light there has been but little inquiry Offal continues in active request, also English and light foreign shoulders. No change has occurred in dressing and shaved hides, as the supply and demand are both limited. Best light kips are now sought after; we quote them ½d. to 1d. per lb. higher, inferior appear to be neglected. Calf skins have been in good demand, and full rates are readily obtained for all fresh consignments. English horse hides sell freely, but Spanish are difficult to place. Only moderate sales have occurred in curried goods; best kip butts, light shoe butts, and middling being the only articles wanted.

LIVERPOOL RAW GOODS, &c.—The markets have recently assumed a firmer tone, and full prices are paid for hides of most descriptions. The supplies for the next few months are likely to be small, which, with an improved demand on the part of tanners, will probably enable us to report some extensive transactions in January; rather higher rates are ruling for valonia and gambier, but in other articles there is no change to notice.—STREATFEILD, LAURENCE, & MORTIMORE.

London, Jan. 4, 1860.

THE TALLOW TRADE IN 1859.

The tallow trade during the past year has been in a most unsatisfactory state, the usual laws of supply and demand having been entirely ignored by a most unusual speculation. We think that a short summary of the business of the year may be of interest to our friends.

The stock on the 1st of January, 1859, amounted to 33,757 casks, and the price was 51s. The new supply at St. Petersburg was estimated at 105,000 casks, and the wintering tallow was 10,000 (these figures proved correct). The supply from South America was reported good, and the Continent was stated to have a good supply of home melt. It was, therefore, reasonable to presume that, with these supplies, there was not room for much, if for any, advance in price; but, even thus early, large purchases of tallow by some speculators in Moscow (not connected with the trade) for delivery in August, began to attract attention, and prices then rose to 45 sil. ro. Many parties then were induced to sell at these high rates, expecting that, when the barks arrived, the operators for the rise would be compelled to resell. In this, however, they were disappointed; for the party who first began the operation induced some men of standing to join him, and with their own funds, and advances obtained on the goods, they succeeded in maintaining the price, and compelling those who were oversold to settle at from 59 to 62 sil. ro., leaving them 25,000 casks in stock at St. Petersburg. They also from time to time sent orders to this market, and bought, it is estimated, from 15,000 to 17,000 casks here. This, with 16,000 casks consigned by them to three houses here, constitutes their interest on this side. The effect of these speculations may be seen at a glance, by the consumption during the last six months, it having fallen off at the rate of 30 per cent., notwithstanding that the state of trade generally has been in a most healthy state; but the feeling against these foreign speculations has been so great that consumers have resorted to every available substitute, curtailing their consumption as much as possible. This has had the effect of increasing the stock by nearly 20,000 casks, and thus preventing the Moscow speculators from having the entire control of the market. We believe they have bought 5,000 to 7,000 casks for delivery in the first three months of this year; so that, when this shall be delivered, there will be little first sort out of their hands.

The stock to-day is 44,454 casks; and we expect that the arrivals from the Black Sea and other places will reach 12,000 casks in the first three months, which will serve to supply the consumption. The new supply, including the quantity left over at St. Petersburg, is estimated at 120,000 to 125,000 casks. The price last quoted was 50 sil. ro. The Moscow speculators having already bought 8,000 casks, no doubt they will make strenuous efforts to keep prices up; but it will be seen from the above statements that they have large quantities to deal with.

The only transactions reported in this market in tallow, for the end of this year, were at 52s. 6d., this being several shillings below the cost of import, the exchange being quoted at 35⅞d. The settlements last week were not large, and prices declined, many holders having waited, anticipating a considerable demand; and, therefore, there was no scarcity of ready tallow to complete contracts. 57s. 6d. was the closing price for the month, 57s. 3d. January to March. To-day the market is quiet, at 57s. 6d. on the spot. Odessa beef 56s. 6d., sheep 57s. 6d., Austrian beef 56s. 6d., town tallow 56s. 9d. net cash. COLCHESTER & WOOLNER.

London, Jan. 2.

THE TRADE IN WOOD IN 1859.

LONDON, JAN. 4.—At the commencement of the new year, it is very important to review the trade in Wood during the year just closed, to trace the extent of the supply, to estimate the consumption, and to see how much stock has accumulated for use in this country while the ports of America and of the North of Europe are closed.

The Wood trade of the United Kingdom is computed from the following tables of the Board of Trade—

	1858.	1859.
Imported of colonial timber, deals, &c.	1,095,771	1,300,000
Foreign	1,131,485	1,360,000
Total loads..................	2,227,256	2,660,000
Consumption (apparent) colonial timber, deals, &c............	1,095,771	1,300,000
Foreign	1,088,167	1,160,000
Total loads..................	2,183,938	2,460,000
Imported duty free, oaks, staves, colonial and foreign, in loads, ..	105,236	110,000

A Comparative Table of the Wood Trade in London follows:—

Importation in London in 1858 and 1859.

	1858.			1859.		
	Cargoes.		Tons.	Cargoes.		Tons.
From Norway and Sweden	527	=	167,000	651	=	208,709
„ Russia and Finland	225	=	65,000	289	=	77,282
„ Germany	359	=	85,000	402	=	110,966
Foreign	1,111	=	317,000	1,342	=	396,957
British America	190	=	118,000	223	=	136,650
Africa, United States, East and West Indies.........	57	=	37,000	59	=	34,536
Total	1,358	=	472,000	1,624	=	568,143

Consumption in London in 1858 and 1859:—

	SAWN WOOD, or Deals, Battens, Boards, & Ends.	HEWN WOOD, or Timber, square & round.
1858......	6,975,000 pieces	..................218,000 loads.
1859......	7,050,000 „	..................245,000 „

The returns of the Board of Trade show that the wood trade of the United Kingdom has recently exceeded two and a-half millions of loads, about half this supply being drawn from our Colonies in British America, and most of the remainder from the North of Europe. From the tables of the wood trade in London we arrive at more definite results: the amount of tonnage shows that nearly one-fourth part of the trade of the Kingdom centres in London: the importation in 1859 appears to have been 20 per cent. more than the average of the four preceding years; the consumption of sawn wood has increased 5 per cent., and of hewn wood 25 per cent., as will be shown on reviewing the state of trade during the last twelve months in London.

FOREIGN TRADE.—From NORWAY and SWEDEN we have received more than half of the supply of foreign wood.

SWEDEN.—From the opening to the close of the navigation there has been a continuous importation from Sweden amounting to the large total of 388 cargoes, equal to 120,651 measurement tons, and containing 1,905,000 pieces of deals and battens, together with 57,000 loads of fir timber. The relative totals in 1858 were 1,480,000 pieces deals and battens, and 34,000 loads fir timber; and in 1857 and 1856, the quantities were less than in 1859 by 20 per cent.; and we only remember one year of larger supply, which was 1855, when we took 20 per cent. more than last year from Sweden, to fill up in a measure the void caused by the cessation of all supply from Russia and Finland.

The value of wood in Sweden having increased in a greater degree than it has been possible to sustain in the London prices, the general importation has not been profitable. At one time the reduced freight gave some promise of importing with advantage, but this was neutralized by bringing into our market a larger supply, when there was a shorter demand, during the building strike.

The prices of Swedish deals and battens have ranged from £12 to £12 10s. standard for the good stocks and favourite marks of the best ports: middling assortments 10s. and 20s.

less, and the level of the lowest qualities has been £10 per standard hundred.

In the sale of Swedish fir timber there has been a perpetual ebb and flow during the past year. During 1858 it touched the common minimum of 50s. per load, but rallied at the close of that season, when the supply was deemed to be short, so that the opening rate in 1859 was 57s. 6d., still rising as the stock was melting away till 62s. 6d. became the highest quotation. By the time the first fleet of Swedish ships arrived, there had been a considerable influx of Danzic fir timber, which supplying to a certain extent the spring demand, kept the Swedish in check. From 57s. 6d. the price decreased each month as the supply increased, until 50s. was again the minimum; 52s. 6d. has since been made, and from this it will probably rise on the reopening of the building season.

NORWAY.—The trade has been rather heavier in battens and lighter in deals. We now have almost a uniform class of battens from Dram, Frederickstadt, Sannesund, and Christiania, and a very limited quantity of the superior character of deals from the two last mentioned ports is now imported. The whole import from Norway amounted to 668,000 pieces of battens, boards, &c., against 561,000 in 1858; 230,000 pieces of deals, &c., against 324,000 in 1858. For cheap battens a steady ready regular sale has now been established; good yellow and most of the white make our best flooring; and the common qualities of yellow being as cheap as square timber, are used for building scantling; £9 to £11 10s. Petersburg standard has been the range of prices. The prime deals of Christiania are of limited use; but when wanted, they realize prices superior to other descriptions of wood. The quotations of best white and yellow are still £14 to £15 Petersburg standard.

NORWAY BALKS.—The importation of 74,000 pieces, computed to be equal to 7,400 loads, being more than required, many have been stored for future use. We observe the import of 1858 was only 44,000 pieces. After beginning at 50s. per load, they fell to 40s. for the common descriptions.

NORWAY SPARS have been imported in the usual form, but not to the usual extent. The totals in 1859, 55,000 spars; in 1858, 69,000. The prices of ladder and scaffold poles, ¾d. to 1½d. per running foot; of spars and small masts, 35s. to 50s. per load.

NORWAY FIREWOOD.—This is a great trade, inasmuch as it has been the freight of 60,000 tons of shipping. Imported in 1859, 20,000 fathoms; sold from 65s. to 90s per cubic fathom.

RUSSIA.—Imported 917,000 deals and battens; 321,000 of which from Archangel and Onega, and 383,000 from St. Petersburg, more than compensate for the shorter supply from Wyburg, consisting of 119,000 pieces. By establishing mills at Archangel, the shippers have extended their trade; and as there is continued esteem for the best red wood deals, we can take a liberal supply, but we cannot offer adequate prices for second qualities as long as Swedish deals are less expensive. The prices paid for Archangel cargoes of first quality, as imported, have ranged from £14 10s. to £15 10s. standard. The Onega stock has been very good, and, being limited in quantity, it commanded the highest quotation. Next in esteem to the deals of the White Sea are those of the Gulf of Finland. The shipments at Cronstadt have been much extended, in consequence of the reduction made in the freight of returning ships, particularly towards the close of the season. The high contract prices of St. Petersburg would have exceeded the net value in London and the outports generally by 10 or 15 per cent., if an equivalent for this had not been given in the abatement of freight. The sales have ranged from £13 to £13 10s. standard throughout the autumn, and the importers are striving to cover the import cost when the trade demand revives. More cargoes than usual of prime Petersburg white deals have been imported, without making much impression on the wholesale trade; the value, divided out, has been from £11 to £11 10s. standard.

WYBURG BATTENS, in 1858, took the place of St. Petersburg in many respects; but during 1859 the substitution of hand-sawn for mill-sawn has changed the character of much of the supply. There were two or three cargoes of mill-sawn, nine and seven inch, for which £12 to £12 10s. was realized, but the hand-sawn stock could not be valued at more than £10 10s. per standard hundred. Some few Fredrickshamm the same.

The shippers at Riga and Narva seem to have been more occupied in preparing railway sleepers then in their old accustomed trade in timber and logs. 4,190 Riga wainscot logs were imported in 1859, many of which should have reached that port for shipment in 1858. Owing to this protracted importation logs have been scarce and prices high. Crown logs 110s. to 120s. each, brack 80s. to 90s. each, both rather dangerous precedents for the next supply.

RIGA FIR TIMBER imported about 5,900 loads, not much of which could be classed above second Memel: 70s. to 75s. per load was the nominal value, but not easily attained while Danzic, Memel, and Stettin was always at hand, and generally cheaper. 174,000 railway sleepers, which represent 17,000 loads of wood, are a large and new feature in the Riga trade, though all were contract importations. There have not been many deals from Riga beyond the stowage of red and white wood required for ships laden with logs and timber.

FINLAND.—From the old northern ports of Finland, we still have a moderate supply, more akin to the hand-sawn Swedish. Forty cargoes, 13,100 tons, containing 268,000 deals and battens. Bjorneborg, Christinestadt, and Wasa are classed together, the prices rising from £9 10s. for the whitewood deals and inferior yellow battens, £10 10s. for yellow deals, and £11 for the yellow planks. From Uleaborg and Jacobstadt, there has been little to notice.

PRUSSIAN PORTS.—Fir timber is the great feature in the past year's supply. The importation from Danzig, Memel, and Stettin is computed to have been, in 1859, about 76,000 loads (127,000 pieces); whereas in 1858 it was only 52,000 loads; in 1857, 67,000, and in 1856, 49,000 loads. If the increased supply of 24,000 loads of Prussian fir timber be added to 25,000 loads previously shown to be the increase in Swedish, we see from what sources the present large stock has accumulated, and why the prices have continued low. In the common consignments of Danzic fir there has been, as usual, insufficient character or denomination to preserve any fixed market value. Still it does not appear that the prices have been lower than in 1858, 50s. to 70s. being the prices which have been paid for all the varieties; at the higher price of 70s., we arrive at the value of second Memel, Stettin fir of long average, and genuine good middling Danzic, rising to 80s. for the best, when such a desigation is not misapplied. The stocks of Zablodousky, Bialowitz, and Blamieser have again to be noticed as superior to other Danzic shipments, but being too costly for the general building trade, most of the importation remains on hand.

The supply of 3,310 Memel wainscot logs has been serviceable as cheaper substitutes for the Riga; and the value of Crown has been raised to 90s. each; brack Memel logs are not desirable.

For Danzic and Memel oak timber there is no certain sale; the importation in 1859 appears to have been about 3,200 loads of square, sided, crooks, and planks, with a very small portion of crown or of dimensions fit for ship-building. The prices can be taken from 60s. to 95s. per load for promiscuous Danzic parcels, and not higher than 110s. for Crown Memel oak.

The importation here of 367,000 railway sleepers, reckoned as 36,000 loads, must be noticed as affecting the provision of tonnage from the Prussian Ports in 1859, though all were supplied on contract.

BALTIC STAVES, imported in 1859, 754 mille of pipe lengths.
607 ,, short staves.

A diminution compared with 1858 and 1857, yet quite as heavy a supply as required for the cooperage business. The cost of staves in the Baltic has been sustained at so high a level, that the coopers and brewers have again used Bosnian single staves for their export casks. That importation has progressed as follows:—

In 1857, 209 mille; in 1856, 1,016 mille; 1859, 2,560 mille. The prices of the Bosnian staves rose as high as £32 per mille when the supply was in danger of being cut off by the blockade of the Adriatic ports, but the rates of £28 10s. to £30 were accepted after the ports re-opened. Memel Crown pipe at the highest were £220, and are now £205 per mille. First brack pipe £170 to £180. Danzic first sizes, £180 to £190; Stettin, £220, with the usual reduction on lesser dimensions.

CANADIAN STAVES.—A languid sale throughout the year.

The import from Quebec consisted of 262 mille standard. The highest prices for superior assortments were £70 to £75 per standard mille. For some large and mixed parcels recently £55 was deemed preferable to holding over. No demand for culls. Puncheon staves, now principally from the lakes of Upper Canada and the United States, take the wide range of £16 to £20 per mille.

United States Staves.—New York standard pipe rank below the best Quebec because of the greater prevalence of worm holes. From the great variety of single staves, we can only quote the extra heavy New York hogshead at £24, thinner staves at £21, £18, and £14 per mille, The double New Orleans hogshead have been sold at £36 while slight staves drop as low as £18 per mille.

Baltic Lathwood.—From Prussian ports 1,280 fathoms, from Russian 1,660 fathoms, both being the stowage of general cargoes; and three cargoes from Sweden. The value was very steadily maintained from £9 to £10 per cubic fathom for the St. Petersburg, from £7 to £8 for the Danzic, and about the same for Swedish Lathwood.

BRITISH AMERICA.—The supply of deals from Canada has amounted to 1,784,000 pieces, of which we may assume four-fifths to have been pine. The supply from New Brunswick and Nova Scotia was 1,543,000 pieces, which were virtually all spruce, so that the quantity of spruce deals exceeded that of pine deals in the importation of 1859. 2nd and 3rd qualities of pine deals had been selling very low throughout 1857 and 1858: towards the close of the latter year there were the first signs of improvement, when seconds were gradually advancing from £9 10s. to £10 10s. Petersburg standard, and realized this higher rate for floated, with £11 for bright in the spring of 1859; the same prices were sustained after the arrival of the first fleet, with a gradual rise to £12 and £12 10s. when so few ships were found to be making good the fall voyages. Third quality in like manner have been lifted from £8 10s. to £10, and even £10 10s. has been realized for choice bright. First quality pine deals were too high to admit of a proportionate advance, but sold steadily at £17 for the floated stock, and £18 and £19 10s. for bright. A few fourth quality of bright pine have been tried without success, for they are split and shaken like the floated culls of olden times.

In white spruce deals we have had a large trade. Very few choice Quebec, and these too costly for the demand; some 20 cargoes of the St. Lawrence spruce from the mills below Quebec, as of a medium quality, are suitable for the consumption of the time, at about £9 10s. per standard for seconds; but the first quality, as now assorted at these mills, do not command 20s. more. For thin spruce and promiscuous dimensions there is always a poor sale, except for the clean first quality deals and battens.

The shipments of spruce deals in New Brunswick were extended beyond our usual demand, when the ships of the United States, seeking employment in those waters, accepted low rates of freight. Until that time, the prices for mixed or average second spruce deals had been £9 5s. to £9 9s., when the importers, lacking confidence, accepted £8 10s. for many cargoes. From this depression, as the freight recovered and the shipments were restricted, there was an easy advance, and now the rates of the spring have been resumed.

Quebec Pine Timber.—Imported 5,846 logs, contents about 9,300 loads. This supply consisted of ship's deck and building pine, for there is no recognition of it as board timber. Some fine parcels have commanded 75s. per load—though, as the stock on hand is more than equal to the whole importation, it will be clear we had but limited demand, and hold over some of the import of 1858. Timber of small metings has been saleable at 55s. per load.

Red Pine Timber.—Imported 3,298 pieces. Its use as building timber has been superseded of late years by the cheaper Baltic fir, and we cannot quote more than 55s. to 65s. per load for such timber. For clean, choice parcels, with some pieces suitable for yards, spars, &c., there is generally a ready sale, according to the dimensions, from 85s. to 105s. per load.

Elm Timber.—Imported 2,784 pieces, chiefly good rock elm, of full metings, and worth 90s. to 100s. per load.

Ash Timber.—Imported 1,144 pieces; prices 60s. to 70s. per load.

Birch Timber.—3,452 logs of Canadian, and 3,768 logs from Nova Scotia and Prince Edward's Isle, form the supply of 1859. This was a small and safe quantity, so that the demand has taken it off while fresh. Stout sizes of the lower port fetched 75s. per load, and the well squared Canadian 80s. to 85s. per load, a prime lot occasionally bringing 100s.

Quebec Oak Timber.—A considerable quantity of old oak has been held over. The fresh timber has been saleable at 110s. per load, and as the import of the past year was only 916 logs, 1,460 loads, better prices are expected for the late supplies. The old timber is not esteemed.

Spanish Oak.—Several cargoes have been imported for navy use. There are apparently fine shipbuilding forms and dimensions to be procured from Spain, if judgment is used in the selection and conversion, but for the private trade no value has yet been set on it.

African Oak.—The demand has almost ceased, probably from our market stock consisting of small sizes, the large dimensions being taken for the navy.

Moulmeine Teake.—Imported in 1859, 12,000 loads; in 1858, 22,000 loads; in 1857, 15,000 loads. All large totals, and at one period, early in the past year, the stock amounted to nearly 20,000 loads: owing to large purchases made for our own government as well as for several foreign States, the new supply and old arrears of stock have been required. From £10 10s. there has been a progressive upward movement to £12 10s. per load, and higher prices are expected. Teake has been imported of lower quality and of inferior conversion for the last two years, which has tended to keep the prices low.

Greenheart from British Guiana.—No stock on hand. The small importation made has been directed to the navy yards; value £8 10s. to £9 per load.

United States Pitch Pine.—Imported in 1859, 12,500 loads in logs and planks. For the latter the demand increases for ships' decks and for stair treads; the value, when clean and clear of knots, £14 to £15 10s. per Petersburgh standard hundred. The Darien and best Savannah timber has ruled from 80s. to 90s. per load.

Masts.—At the close of the year one cargo of Canada pine masts arrived, till when there had been no fresh supply of good masts for the private trade. Many of those imported in 1858 were deemed superior as Canadian masts, but none can compare with the new importation from Oregon and Vancouver's Isle. Four cargoes of these magnificent trees (said to be *Abies Douglasii*) have been imported, creating as much wonder in the naturalist as in the trade. In length, 100 to 130 feet; in diameter 30 to 39 inches throughout their length: straight, without knots, with scarcely any sap; sound, strong, and not weighty; these splendid trees combine all the qualities required in masts, and have already attracted the attention of our own and foreign governments. The principal and largest masts of this Oregon wood have been valued at £12 per load; topmasts and mainyards, £8 10s. to £10 10s. per load; bowsprits and smaller spars in proportion. Canadian masts will we fear be less valued than heretofore. Small Riga hand masts have been imported for special purposes, but their cost is too high for general use. Some coarse Stettin were sold at £3 to £5 per load. The Kawrie masts of New Zealand are still in high esteem for the navy and first-class ships, though they are as costly to import as the Oregon masts, and are not of the same enormous dimensions.

Freight forms so considerable an item in the import-cost of wood that it is essential to subjoin the rates paid during 1859. From Quebec and the various loading coves in the St. Lawrence, the early charters were made at 80s. standard for deals; 85s. to 90s. standard for timber lading. Some reduction was made when the American and other foreign ships were seeking freights, but the rates were lifted to 95s. and 100s. for the fall ships. From St. John's and the neighbouring ports of New Brunswick, the chartering rates for London were 75s., but seeking ships were taken at, and some even under, 65s. Memel and Danzic freights opened at 14s. per load, rose to 17s. for late voyages, and even to 18s. before closing; Riga, 17s. to 20s. per load, with additions for logs and masts. Petersburg charters were opened at 45s. standard; then 35s. to 40s. were taken, and for some return voyages 25s. to 32s. 6d. For Swedish ports in the Gulf of Bothnia 45s. was the medium rate: there were times when 5s. less were taken, and 10s. more were given as the season advanced. From Finland about 50s. standard. Archangel and Onega 75s. and 80s. was the general rate. The quotation was at one time 70s., but again recovered, and 90s. were given to secure the late ships. Savannah and Darien, 35s. to 40s. per load. Moulmeine ships arriving with old charters at 90s. to 105s. per load; while charters in India were made from 60s. to 70s. per load.

At the opening of the year 1859, there seemed every prospect of a healthy and vigorous trade throughout the country. Counteracting influences have, however, disappointed this hope. The war in Italy affected all our commercial relations, and no sooner had the war ceased than the wood trade was especially damaged by the builders' strike. We have shown that the consumption of wood has increased, but there has been no spirit, no confidence in speculation, no trust in the future. At the period when large quantities of wood should have been consumed, the ill-judged strike of the operatives sacrificed two valuable months in the year of the building trade.

The price of wood in the countries of its production has been so much higher of late years, that an importation now seldom realizes its first cost. During the past year there was no disposition to pay the prices demanded in Russia and in Sweden, until after the shipowners were compelled to carry the wood, in some instances for half, and in many, two-thirds of the customary freight.

There are again before us the elements of a better trade. We have cheap building materials in hand, the condition of all classes has improved, there is plenty of money, credit is sound, and the counteracting influences of the past year are not likely to recur. CHURCHILL AND SIM.

REVIEW OF THE ARTIFICIAL MANURE AND OILCAKE TRADE DURING THE PAST YEAR.

In reviewing the state of the artificial manure trade during the past year, I think I may say it has been on the whole both satisfactory to the manufacturer and also to the farmer, the one having been able to buy his raw materials at a price remunerating to him to manufacture from, and the other that he has been able to procure what he has required at a low rate; and from reports received from the principal local manufacturers he has taken advantage of this state of things.

The unsatisfactory price of grain has made agriculturists chary in laying out their money on manures, but the time has now arrived when he feels himself bound to keep up this artificial mode of cultivation to compete at all with his neighbour in the produce of his acres.

Peruvian guano still remains in the hands of the monopolists, who have kept the price up at their pleasure, and much above its real value compared with other artificial manures, but it is satisfactory to know that the quantity sold has been far short of any former year, and so proving beyond all doubt that substitutes can be obtained of equal value to the consumer at a lower price, thus showing our chances of producing a crop are not quite dependent on the Peruvian Government for an artificial manure. The stock this time last year was nearly 300,000 tons; the import has been only slightly over 20,000 tons; and the present stock is about 180,000 tons, thus leaving the sales at 140,000 for the whole year.

Superphosphate of lime has been largely made use of, but I think I am correct in stating the London manufacturers have not experienced such a demand as they have been accustomed to, owing to the great increase of local makers all over the kingdom, and the preference given by purchasers to manures made in their own districts. The value of good superphosphate made from bones containing a fair amount of soluble phosphate is too well known to call for any remark here; the best proof is that at most of the agricultural meetings held during the last autumn prizes were awarded to roots grown with this manure in many more instances than when produced with Peruvian guano.

The price of nearly all raw materials has been on the decline throughout the year.

Bone Ash at the commencement of last year was selling at £5 to £5 10s. per ton, but as the season advanced cargoes were pressed on the market until the price gave way considerably, and some large purchases were made both here and in Liverpool at £4 per ton. Stocks are small, and the quantity on the way insignificant, and the value is now £4 7s. 6d. to £4 10s. for 70 per cent. Phosphate of Lime.

Bones have been largely sold, the price being so much in favour of the buyer. Immediately after the close of the season the price dropped from £5 5s. to £4 5s. to £4 7s. 6d. per ton, and at this price some large contracts were entered into; since which they have slightly improved, and the value now is £4 10s. to £4 15s. for South American, and £4 10s. to £4 12s. 6d. for good clean London collected.

Animal charcoal has fluctuated from £5 to £4 10s., at which several cargoes of London make have been sold for delivery at outports.

The Estramudara phosphate of lime, of all other materials, will eventually be the most valuable to the manufacturer of artificial manures. Several analyses have been made and opinions obtained from various chemists, showing its great superiority over all sources of phosphate yet discovered. Important arrangements are in progress for insuring a regular supply, and in a short time arrangements can be made for any sized cargo for outports in the United Kingdom. It has been tried by several superphosphate makers, who all pronounce it the most soluble material in acid yet used. It is perfectly free from any carbonate of lime.

Coprolites, owing to the extremely low price of all bone phosphates, have been rather neglected by the trade; they are, however, a cheap source of phosphate at the present price—they have been sold as low as 38s. and 50s. per ton for whole and ground respectively, free on board on the east coast.

Nitrate of soda has fallen from £16 to £15 5s. and £15 10s. per ton—the latter is the price for spring delivery.

Sulphate of ammonia has remained almost stationary throughout the year; there has been no export demand, so that the whole make has been at the disposal of the home trade—£14 to £14 5s. for brown, and £14 5s. to £14 10s. for white is the present value.

Sulphuric-acid is perhaps the only article used by the artificial manure manufacturer that has been difficult to buy with the same advantage as other ingredients. The steady state of the brimstone market has caused the acid-maker to be cautious in making his contracts; but where barytes can be burnt, as in many of the provincial cities, of course this remark does not apply. A few contracts for brimstone-made acid were made early in the autumn for immediate delivery as low as 0¾d. per lb., with 26 per cent. discount; but now it is not easy to buy within 5 per cent. of this price. Acid made from barytes has been sold considerably under £4 per ton.

OILSEED CAKES.

Linseed cakes have been imported to a liberal extent throughout the year, but owing to the very low price of all descriptions of grain, they have been a forced sale at a comparative value with other feeding commodities, and at a loss to the importer. The present open weather has been much against the usual winter demand, and when prices are expected to improve. The finest American cake in barrels is worth £10 5s. to £10 10s.; and in bags, £9 7s. 6d. to £9 15s. per ton.

Cotton seed cakes of American make, called decorticated, or crushed, with the husk taken off the seed, are much in favour with the leading feeders, and full prices have been paid for all that have come to market. At the present time there are none here, and £7 10s. was the last price paid.

Rape cakes are now scarcely inquired for, for feeding purposes, the supply being almost entirely from home crushed seed, which is generally more or less heated. Only one cargo of the green sort has been imported throughout the year. JOHN KEEN, Agent.

35, Leadenhall-street, E.C.

ANNUAL REPORT OF THE PROVISION MARKET.

The past season opened in December, 1858, at moderate prices, say for Dantzic, Irish, and Hamburg prime mess pork 85s. to 90s. per barrel, and American prime mess beef 100s. to 110s. per tierce, and India beef at about £7 per tierce. The market would probably have barely supported these quotations throughout the year, but the Italian war caused such an unexpected demand, through the requirements of France, Austria, and Sardinia, and for which we were quite unprepared, that at one period our stocks on hand were nearly all taken away at an advance of 25 per cent. upon the above opening quotations; pork selling at 110s. per barrel and 9*l.* per tierce, and beef, although not in so much request, was similarly influenced, as the stock of this was small.

These high rates encouraged supplies from different countries, so that as the war came to an early conclusion, the season is winding up at about the same rates at which it commenced.

We are now on the eve of a new season, and we are happy to find from the samples that have come forward, that the quality promises to be finer than last year, the opening prices being about the same; yet we must not lose sight of the fact, that population increases in a greater ratio than food, thus making a demand for live hogs and cattle, from the provinces, and all the adjacent countries, to an almost unlimited extent; this tends greatly to advance the price of salt meats for shipping purposes; steam vessels and railways bringing meats to market in a fresh state, that formerly were obliged to be salted; besides which, the continual influx of gold, and the consequent increase of money all over the world, has enhanced the rates of produce very considerably, and is likely to have a still greater effect, leaving out of consideration the possibility of any political derangements.

There has been a gradual advance in the price of provisions for the last 30 years; formerly Ireland alone supplied all the extra wants of this country, and now nearly every country in Europe, together with America, can scarcely meet our demands, although drawn upon to the full extent of their surplus food (and under free-trade). Irish bacon that sold at 36s. per cwt., now brings 63s. and 70s. per cwt.; Irish pork 60s. per brl., now 90s. to 100s.; beef that was then at about 80s. per tierce, has now advanced to 100s. and 120s.; butter, with a duty of 20s. on foreign, that realized about 84s., now sells at 110s. to 120s. per cwt., although the duty on foreign butter has been reduced to 5s. per cwt.; Dutch cheese also, which formerly sold at about 42s. per cwt., with a duty of 10s., is now selling at 63s., with the duty reduced to 2s. 6d. per cwt.

It may, therefore, be worthy of observation to the political economist that the abundance of money seems to give no stimulus to increase of agricultural productions, but rather the contrary; whilst on the other hand, cheap money seems to exert a great influence in over-building, whether of ships or houses, as well as by encouraging speculations of every kind, where the security is immediately transferable. We noticed this particularly some years ago in America, when, through the agency of the United States' bank, money was made so artificially plentiful, and all kinds of speculation fostered thereby, that the United States at that time ceased to produce enough food for themselves, so that large orders came to this country for Irish provisions, another proof of the well-known axiom, that cheap money enables those to speculate in the productions of others, who ought to be producing something for themselves.

EDMUND PHILLIPS & SON.

London, Dec., 1859.

EXPERIMENTS WITH MANURES ON ASHCROFT'S SWEDE TURNIP.

SOWN 23RD JUNE, AND LIFTED 29TH NOV., 1859.

No.	Description of Manures.	Cost per cwt.		Quantity applied per imperial acre.			Cost per acre.		Weight of bulbs per acre.				Cost per ton of bulbs.	
		s.	d.	cwt.	qr.	lb.	s.	d.	tons	cwt.	qr.	lb.	s.	d.
1	Calcined bones (Poynter)	7	3	7	0	19	51	11¾	20	18	0	12	2	5¾
2	Calcined bones (Townsend)	7	6	6	3	21	52	0	19	4	3	2	2	8¼
3	Dissolved bones (Newcastle Chemical Co.)	8	3	6	1	0	51	6¾	19	3	3	10	2	8
4	Blood manure (Odams)	7	0	7	1	17	51	9¾	20	2	3	8	2	6¾
5	Turnip manure (Proctor & Ryland)	7	8	6	3	4	52	0	20	8	3	10	2	6½
6	Phospho Peruvian guano (Seagrave)	11	6	4	2	1	51	10¼	19	8	1	25	2	8
7	Peruvian guano (Gibbs, Bright, & Co.)	13	0	4	0	1	52	1¼	18	0	1	7	3	0
8	Upper Peruvian guano (Williamson)	8	6	6	0	10	51	9	20	14	3	13	2	5¾
9	Ammoniacal guano (Newcastle Chemical Co.)	10	9	4	3	12	52	2	20	8	1	15	2	6½
10	Superphosphate of lime (Jordans)	8	0	6	1	26	51	10¼	19	12	0	20	2	7¾
11	No manure	—		—			—		3	17	3	0	—	

The manures experimented upon were the best of their kind. The experiments were thoroughly accurate, and sufficiently extensive for all practical purposes. The land a dry turnip and barley soil, lying upon clay slate, and in bad condition.

The lightness of the crop is accounted for from the dry season delaying the period of sowing.

Borgue House, Kirkcudbright.

THE MANURE TRADE.

No better proof can be afforded of the attention paid to agriculture in Great Britain, than the extent and value of the trade in manures. We allude particularly to the imported fertilizers and artificial manures, the aggregate value exceeding two millions a year. The increased demand for these substances has called into activity many individuals and companies who make a business of importing, preparing, vending and analyzing manures; while many shipping firms have directed their attention specially to the subject, and given employment to a considerable amount of tonnage. The growing interest and importance of the trade is manifest from the number of manure circulars now issued and the interest taken in every new source of phosphates, and the increased manufacture of sulphuric acid.

That this has become an important department of commerce is manifest from the fact that last year, besides about 140,000 tons of guano used, 80,000 tons of bones and bone-ash, and 25,000 tons of nitrate of soda were imported, besides nitrate of potash, rapecake, and and some few other foreign substances. When we take into consideration the superphosphates, salt, soda ash, gypsum, coprolites, and many patent or compound manures, the extent of the trade may be judged of.

It is satisfactory to find, from the remarks of Mr. John Keen, that while the sales of guano were in 1859 far short of any former years, substitutes can be obtained, of equal value to the consumer, at a lower price; thus showing our chances of producing a crop are not quite dependent on the Peruvian Government for an artificial manure, however highly that manure may be appreciated. The manufacture of superphosphate of lime appears to be extending over the kingdom; and hence bones, coprolites, brimstone, and barytes are in increased demand.

The Spanish apatite, which is likely now to be made extensively available, will prove of great importance to the manure trade. The difficulty of transport to the coast for shipment, which was reported some years ago by Dr. Daubeny to be fatal to its extensive introduction, is now likely to be removed. Indeed, a few small cargoes have already arrived. From its solubility and freedom from carbonate of lime, it will prove one of the best sources of phosphates yet discovered. The inexhaustible deposits at Logrosan, in Estremadura, have long been known to scientific men; but arrangements have now been made for the conveyance of the stone to the coast. In a year or two a railway, now in course of construction, and passing within a few miles of the hills, will convey the fossil at a cheap rate to the Tagus. The enormous extent of the deposits, the cheapness at which they can be worked and shipped, and their proximity to this country, render it probable that this article will in time supersede all other phosphates now used by manure manufacturers.

Some observations occur in the circular of Mr. J. F. Boyd, which are well worth quoting here:—"When the attention of agriculturists was a few years since fairly roused to the necessity and advantage of assisting the soil with preparations containing those chemical elements which science had long shown to be necessary for the purpose of restoring to the land the same elements abstracted from it by the crops, the demand thus created did not gradually and slowly assume its present proportions, but almost at once became very great; hence a field was suddenly opened for the employment of capital, and the large profits notoriously reaped by the few who first engaged in the business speedily attracted numbers to supply the new want. Not satisfied with legitimate means of making money, very many took advantage of the existing state of things to furnish a class of articles which were frequently worse than worthless, and found no difficulty in foisting them upon farmers at incredible prices. Those respectable firms who would not resort to such practices, were at that time satisfied with sending out goods very inferior to those supplied in the present day. The system of adulteration spread from year to year, and attained its full proportion in 1857, when the consumption exceeded that of any year before or since. By this time farmers began to complain loudly of the impositions which had been practised upon them; and a heavy fall in the prices of grain before the next season (that of 1858) setting in, completely changed the aspect of affairs. In that year the demand suddenly became very much smaller. Farmers not having money to spare, began to consider whether they could not dispense with so much manure as they had been accustomed to buy; and the result was that at the close of the season very large stocks remained in the hands of the makers all over the kingdom. Last year the respectable portion of the trade found it advisable to offer the attractions of improved quality and lower prices, and the present custom of guaranteeing the analysis furnished to the buyer was very generally introduced. The consequence is that very many of the doubtful firms have been completely driven out of the trade, and farmers have reason to think more favourably of the good manures which are now so universally sold. Prices are unquestionably much lower, and the margin of profit much less; but this was to be naturally expected to happen some day or other. Manufacturers find their true interest to lie in supplying first-rate goods; and, confidence being restored, there is reason to anticipate a healthy and sound future."

In some of the continental states the use of bones for fertilizing purposes appears to be on the increase; and hence the supplies from Europe are not so large as they formerly were. Still considerable quantities are received at Hull, where the imports last year amounted to 20,381 tons, including 4,618 tons of bone-ash. This was nearly one-third of the whole import. From Russia large quantities are shipped, since a paragraph in our columns last week states that one St. Petersburgh merchant, who has dealt in bones all his life, ships about 1,800 tons annually to foreign countries. It is satisfactory to find that when old sources of supply for this useful substance fails, others are available. Thus, from the South American States and the Colonies, we now draw considerable supplies, which are fully adequate to the demand, and keep prices moderate.

Mr. Braithwaite Poole, the manager of the London and North Western Railway at Liverpool, after careful investigation and numerous inquiries, estimated, a few years ago, the quantity of farmyard or animal manure used in the country at 90,000,000 tons, worth £20,000,000 sterling; but this forms a very small proportion of the manure now used for our soils. Another well-known statist, Mr. McLure, twenty years ago, calculated the quantity of animal or farmyard manure available annually in the kingdom at 329,300,000 tons, of the value of nearly £60,000,000! But these are, after all, mere vague calculations, and do not include the other manures, animal and mineral, now so largely applied for the improvement of our soils.

Manure is as essential to a farm as daily food is to an animal; both must be procured at any cost. And it is the careful husbanding or purchase, and proper application in due season of suitable fertilizers, which distinctly proves the skill and judgment of the cultivator; for on these additions the produce of his land will mainly depend. To sum up, in the words of a correspondent a week or two ago: "To render the present refined state of chemical analysis subservient to the daily operations of practical husbandry, it is not only necessary that the farmer should know the nature of the mineral and saline ingredients extracted from the soil by the crops raised, but that he should have the means of restoring to the land any of those ingredients indispensable to the proper development of a crop, of which it may be deficient."

THE SEWAGE OF TOWNS.

BARON LIEBIG AND ALDERMAN MECHI.

Sir,—I trust that the great importance of the subject may induce you to give insertion to the accompanying communication, which I have received from Baron Liebig.

I am, Sir, your obedient servant,
J. J. Mechi.
Tiptree Hall, Kelvedon, Essex.

Munich, Nov. 17.

Dear Sir,—Your letter, of the 7th of November, to the *Times* furnishes me an occasion to express to you my sincere thanks for the views to which you there give utterance, and which I have laboured many years to impress. I am sorry not to be able to say that my efforts have been attended with any perceptible results, and I regard it as a fortunate event that a man of so eminently practical a character as yourself has now for the first time, in the interests of agriculture, and the national welfare, taken up the question of the "sewerage of towns" with warmth, and in language adapted to produce conviction.

It is my ardent wish that you may succeed in awakening the English people to your own convictions; for in that case the ways and means for setting aside the difficulties which stand in the way of procuring manure from the "sewerage of towns" will certainly be found, and a future generation will look upon those men who have devoted their energies to the attainment of this end as the greatest benefactors of their country.

The ground of my small success lies clearly in the fact that the majority of farmers do not know the extent to which their own interests are concerned in this matter, and because the views and conceptions of most men in regard to the circuit of life and the laws which govern the preservation of the race do not generally rise above those of C. Fourrier, the inventor of the phalanstery. He proposed, as you know, to supply the wants of the occupants of his phalanstery by means of eggs. He supposed it was only necessary to procure a couple of hundred thousand hens, each of which would lay thirty-six eggs a year, making as many million eggs, which, sold in England, would produce an immense income. Fourrier knew very well that hens lay eggs, but he seemed not to know that in order to lay an egg they must eat an amount of corn its equal in weight; and so most men do not know that the fields, in order to yield their harvests, must either contain or else receive from the hands of man certain conditions which stand in the same relation to the products of the field as the hen's food does to the eggs she lays. They think that diligent tillage and good weather are sufficient to produce a good harvest; they therefore regard this question as one in which they are wholly unconcerned, and look forward carelessly and with indifference to the future.

As physicians who in the apparent signs of a young man's blooming health discern the fatal worm which threatens to undermine his organic frame, so in this case should those discerning men who are capable of comprehending the range of the question raise the earlier the voice of warning.

It is true that the diligent tillage of the fields, sunshine, and timely rain are the outward conditions, perceptible to all men, of good harvests; but these are perfectly without effect upon the productiveness of the field, unless certain things, not so easy of perception by the senses, are present in the soil, and these are the elements which serve for nourishment, for the production of roots, leaves, seeds, and which are present in the soil always in very small quantity, in proportion to the mass of the soil itself.

These elements are taken from the soil in the products of the field—in the corn or in the flesh of the animals nourished by these products, and daily experience shows that even the most fruitful field ceases, after a certain series of harvests, to produce these crops.

A child can comprehend that under these circumstances a very productive field, in order to remain very productive, or even simply productive, must have the elements which had been withdrawn in the harvests perfectly restored; that the aggregate of the conditions must remain, in order to produce the aggregate results, and that a well, however deep it may be, which receives no supply of water, must, in the end, become empty, if its water is constantly pumped out.

Our fields are like this well of water. For centuries those elements which are indispensable to the reproduction of the crops have been taken from the soil in those crops, and that, too, without being restored. It has only recently been ascertained how small a supply of these elements the soil really has. A beginning has been made to restore to the fields the losses which they sustain through the annual harvests, by introducing from external sources manures containing the same elements. Only a very few of the better informed farmers perceive the necessity of this restoration, and those of them who have the means have zealously endeavoured to increase the amount of these elements in their fields: but by far the greater part of them know nothing of such restoration. They think that they may continue to take from the field as long as there is anything left, and that it will be time enough to provide for this necessity when it knocks at their doors. They do not, of course, know how large their stock on hand is, nor are they aware that when the necessity shows itself there will be no means to correct it; they know not that what they have wasted is irretrievable.

The loss of these elements is brought about by the "sewerage system of towns." Of all the elements of the field which, in their products, in the shape of corn and meat, are carried into the cities, and there consumed, nothing, or as good as nothing, returns to the fields. It is clear that if these elements were collected without loss, and every year restored to the fields, these would then retain the power to furnish every year to the cities the same quantity of corn and meat; and it is equally clear that if the fields do not receive back these elements agriculture must gradually cease. In regard to the utility of the avails of the "sewerage of towns" as manures, no farmer, and scarcely an intelligent man, has any doubt; but as to their necessity opinions are very various.

Many are of the opinion that corn, meat, and manure are wares, which, like other wares, can be purchased in the market; that with the demand the price may, perhaps, rise; but this will also stimulate the production, and that all turns upon having the means to purchase; and so long as England has coal and iron, she can exchange the products of her industry for the corn, meat, and manure which she has not. In this respect I think it would be wise not to be too confident of the future, for the time may perhaps come, even in half a century, that not one of those countries upon whose excess England has hitherto drawn will be able to supply her with corn, and that, too, from the natural law that what is true of the smallest piece of ground is true also of a great country. It ceases to produce corn if the conditions of the reproduction of the corn which has been carried off are not restored to it. Nor is it, furthermore, certain whether the corn-growing countries will always desire to exchange their corn for the products of English industry, since they may no longer need these products, or, at least not in the ratio of England's need of corn. In the countries of Europe and in the United States of North America great efforts are made to become in this respect independent of England, as being in the end the only way of keeping the corn prices in these countries so as to repay the labourer.

In the United States the population increases at a still greater ratio than in other countries, while the corn production upon the land under cultivation has constantly fallen off.

History teaches that not one of all those countries which have produced corn for other lands have remained corn-markets, and England has contributed her full share towards rendering unproductive the best lands of the United States, which have supplied her with corn, precisely as old Rome robbed Sardinia, Sicily, and the rich lands of the African coast of their fertility.

Finally, it is impossible in civilized countries to raise the corn production beyond a certain limit, and this limit has become so narrow that our fields are no longer capable of a higher yield without an increase of their effective elements by the introduction of manures from abroad.

By the application of guano and bones, the farmer of most limited capacity learns the real import of such increase; he learns that the pure system of stall or home-made manures is the true and genuine robber system. In consequence of his restoring in the guano and bones but a very small portion of those very small elements of seeds and of fodder which had been withdrawn from his fields by centuries of cultivation, their products are wonderfully increased. Experiments instituted with special reference to this end in six different parts of the kingdom of Saxony showed that each hundred-weight of guano put upon a field produced 150lbs. of wheat, 400lbs. of potatoes, and 280lbs. of clover more than the same sized piece of ground without guano; and from this it may be calculated how enormously the corn and flesh production of Europe has been increased by the yearly importation of 100,000 tons, or 2,000,000 cwt. of guano.

The effect of guano and bones should have taught the farmer the real cause of the exhaustion of his fields; it should have taught him in what a condition of perpetual fertility he might have preserved his fields if the elements of the guano which he has transported in the shape of meat and products of his fields into the cities were recovered and brought into a form which would admit of their being restored to his fields every year.

To an understanding of this, however, the farmer has not yet come; for, as his forefathers believed that the soil of their fields was inexhaustible, so the farmer of the present day believes that the introduction of manures from abroad will have no end. It is much simpler, he thinks, to buy guano and bones than to collect their elements from the sewers of towns; and if a lack of the former should ever arise, it will then be time enough to think of a resort to the latter. But of all the erroneous opinions of the farmers, this is the most dangerous and fatal.

If it is perceived that no country can perpetually supply another with corn, then must it be still easier to understand that an importation of manures from another country must cease still earlier, since their exportation diminishes the production of corn and meat in that country in so rapid proportions that this decrease in a very short time forbids the exportation of manures. If it is considered that a pound of bones contains in its phosphoric acid a necessary condition for the production of 60lbs. of wheat, that the English fields have become capable by the importation of 1,000 tons of bones of producing 200,000 bushels more of wheat in a series of years than they would have produced without this supply, then we can judge of the immense loss of fertility which the German fields have sustained by the exportation of so many hundred thousand tons of bones which have gone from Germany to England. It will be conceived that if this exportation had continued, Germany would have been brought to that point that she would no longer have been able to supply the demand of her own population for corn. In many parts of Germany, from which formerly large quantities of bones were exported, it has now already come to be the case that those bones must be, at a much higher price, bought back again in the form of guano in order to obtain the paying crops of former times.

The exportation of bones for so many years from Germany was possible only because the German agriculturists had less knowledge of the real nature of their business than the English, believing, as they did, that practice and science taught doctrines contradictory to each other, and were fundamentally different things, and that they must trust, not in the laws of Nature, but in receipts. Things have now changed for the better, although not to the extent which was to be desired, for the German farmers do not as yet generally understand the value of the elements of bones for preserving the present fertility of their fields (not to speak of the restoration of their former fertility), for if they all understood this, no one could have any more bones—at all events no more than those which he brings to market in his grain and cattle.

The prices of bones have become so high in Germany as to forbid their exportation; and if the question should be put to English commerce whence it furnishes the English farmer with this to him so indispensable manure, the answer would produce astonishment; for this commerce has already so far robbed all the inhabited parts of the earth, that the manufacturer of superphosphate can only set his hopes upon the phosphate of lime of the mineral kingdom.

In relation to guano, I have been assured that in 20 to 25 years, if the use of guano should increase in even the same proportion as hitherto, there will not remain in South America enough to freight a ship. We will, however, suppose its supply and that of bones to continue for 50 years, or even longer; then what will be the condition of England when the supply of guano and bones is exhausted?

This is one of the easiest of all questions to answer. If the common "sewerage system" is retained, then the imported manures, guano, and bones make their way into the sewers of the cities, which, like the bottomless pit, have for centuries swallowed up the guano elements of the English fields, and after a series of years the land will find itself in precisely the condition it was in before the importation of guano and bones commenced; and after England shall have robbed the cultivated lands of Europe even to complete exhaustion, and taken from them the power to furnish her longer with corn and manure, then she will not be richer than before in the means of producing corn and meat, but will from that time forth become even poorer in these means.

By means of the importation of guano and bones the population has, however, in consequence of the increased production of corn and meat, increased in a greater ratio than would have been possible without this importation of manures, and this population will make upon the rulers of the State their natural demand for food.

If men do not deem it desirable that the balance between population and the supply of food be restored by means of exterminating wars and revolutions (in which the want of food has always played a certain part), or by means of wasting plagues, pestilence, and famine, or by emigration *en masse*, then should they reflect that the time has arrived for getting a clear view in regard to the causes of existence and increase of population. A very little reflection will lead to the conviction that the relations of populations are governed by a great and comprehensive natural law, according to which the return duration, increase or diminution of a natural phenomenon depends upon the return, duration, increase, or diminution of its conditions. This law governs the return of the harvests upon our fields, the maintenance and increase of the populations; and it is easy to see that a violation of this natural law must exert upon all these relations a pernicious influence which can be set aside in no other way than by the removal of its causes. If, then, it is known that certain existing circumstances work deleteriously upon the fields; if it can be foreseen that their continuance must bring about the ruin of agriculture; if there is but a single one of all the means which have hitherto resisted this deleterious influence, and made it less sensibly felt, which can be safely relied upon to secure a perpetual fertility to our fields, and this means, by a simple change and improvement of the existing deleterious state of things, can be obtained, then it becomes us to think whether a nation should not summon up all her intellectual and material resources in order to preserve these fundamental conditions of her welfare.

It has been maintained that the recovering of the manure-elements out of the sewers of large cities is impracticable. I am not ignorant of the difficulties which stand in its way. They are, indeed, very great; but if the engineers would come to an understanding with the men of science in relation to the two purposes—the removal of the contents of the sewers and the recovery of their valuable elements for agriculture—I do not doubt that a good result would follow. Intelligence in union with capital represents a power in England which has rendered possible and practicable things of much greater apparent difficulty. I look forward with deep concern to the solution of the sewerage question; for, if this question is decided in Great Britain without regard to the wants of agriculture, we can scarcely hope for anything better upon the Continent.

Permit me to add still a few words in relation to the leading article of *The Times* of the same date, in which the one side of this question is taken up with great clearness, while the author of the article seems to have not quite a correct view of its bearing as it presents itself to my mind. The mistake into which he has fallen arises from his confounding the condition of a State with that of its population.

In the natural sciences we know nothing of a State—of its might or its feebleness. We know only lands, their geological formation, their climate and soil, and whether the soil contains the natural conditions of the subsistence of man and beast. In places where these conditions are abundantly present, and geological circumstances do not hinder their intercourse, men cannot be exterminated. The most wasting war cannot rob a land of the conditions which nature has given, nor can peace give them to land which wants them.

Countries may be fruitful and become capable of sustaining a large population when certain resisting influences, which in their unhindered working make the cultivation of the soil impossible, are overcome by human intelligence, or when a land has all the conditions of productiveness except one, and then receives the one which it lacked. If Holland were without her dikes, which must be kept up at great expense, she would produce neither corn nor meat; the land would not be inhabitable. In a similar manner the inhabitant of the African oasis protects his grain fields by dikes against the storms of the desert, which cover his land with a barren sand; and if Mr. Layard is disposed to answer the question put to him, he will say that the decay of an admirable system of irrigation rendered the permanent maintenance of a great population in Assyria and Mesopotamia impossible.

I know that the prophets of future evil have at all times been derided by their own generation; but, if history and natural laws can furnish any ground for a just conclusion, then there is none which stand more firmly than this—that, if the British people do not take pains to secure the natural conditions of the permanent fertility of their land—if they allow these conditions, as hitherto, to be squandered—their fields and meadows will at no distant time cease to yield their returns of corn and meat. But it does not belong to the province of natural science to discuss the question whether the might, strength, and independence of the nation will be preserved after this state of things shall have gradually arisen.

Believe me, dear Sir, yours very truly,

JUSTUS VON LIEBIG.

Mr. J. J. Mechi, Tiptree-hall, Kelvedon, Essex.

PROGRESS AND PROFIT OF THE STEAM-PLOUGH.

A patriotic agriculture should seek to feed its own countrymen; and if the task of growing bread-corn and butchers' meat on a limited acreage for a people doubling itself every half-century may appear too preposterous, at any rate it is possible to reduce that immense importation for which we have to beg abroad, and trust the chances of natural and other breezes on the seas. In Great Britain we suppose there are about 19,000,000 acres arable, and nearly as much grass; and there remain but few unenclosed commons and wayside lands capable of ordinary culture which are not already brought under the plough, or converted into improved pasturage. We have mountain wastes, moorlands, heaths, and downs, not too lofty, bleak, and barren to reward the enterprising reclaimer; we have woods and forests that might be cleared, sands that might be planted, sheep-walks that could be improved, bogs that can be made sound, fringes of salt marsh that may be recovered from the tide. But most of these are fields of speculative labour beyond the range of ordinary business, yielding a slow return of the expenditure in grubbing, marling, draining, and costly hand tillage; sometimes, indeed, being only reclaimable by the pick and spade of the cottager—as the granite and slaty wastes of West Cornwall, where thousands of working miners have their four-acre plots, so prominent in the land schemes of political economists. All England, Wales, and Scotland below such wild altitudes, and wherever good husbandry, with advanced machinery and improved live-stock, has been hitherto practicable, lies in farms from which the copses were grubbed, or the rabbits banished, or the meres and plashes dried up, long ago. On these cultivated land we may gain room by removal of straggling fences, and by curbing wandering brooks; but here our acquisition of surface ceases, unless we encroach on the park and pleasure-ground, and fell the timber in necessary woods and plantations. Any increase, then, of our annual produce of some 16 million quarters of wheat, as well as the raising of more meat and other supplies, must be obtained by augmented yields per acre. If the agricultural management of the whole kingdom equalled that of our forwardest counties, and all estates even in first-class localities were farmed as highly as a small proportion already are, the simple extension of the best husbandry over the area now in cultivation might soon double our harvest, as well as our cattle and poultry markets. But the permanent improvement of land moves slowly. Companies are actively assisting the landowners, still not a quarter of our drainable ground is yet drained; and the absolute necessity of farm-buildings that will preserve the products of the soil is being very gradually acknowledged and supplied. Smaller and handier resources however have come largely to the help of the farmer. The tenant-farmer is availing himself of imported and manufactured feeding-stuffs and home and foreign fertilizers at an enormous expenditure every year, and he is purchasing more extensively than ever the best machinery for expediting and economizing every process of his art—steam-engines alone being supplied him at the rate of 10,000-horse power per annum; and he is thus bestirring himself for a more urgent consideration than the advantage of swelling our aggregate home produce. Rents have been steadily rising, while a growing population has added to the competition for farms. As time moves on, the labourer, as well as the landlord, looks for better pay; and yet a low range of prices can alone be expected in the corn-market. Our turnips rot as our potatoes did, and if we pamper the grain crop beyond its strength, we get only so much more fodder and litter instead of an increase of corn. And the most awkward and difficult of our heavy soils do not pay for their tillage at all. In fact, the farmer's present position is somewhat critical; and some far-seeing rural prophets already descry a coming crisis of agricultural distress unless something readier and speedier than the common resort of land improvements arise to avert the calamity. In this emergency it is that we welcome the perfected steam-plough—to prove, if we mistake not, as great a relief to our husbandmen as the "jenny" once was to the cotton-spinners. Let the rental rise as the country advances, let public burdens continue to weigh heavily, and the labourer obtain the hire of which he, if any man, is worthy; we can nevertheless diminish our farm outlay, and augment our yields by the aid of the mighty motive power which can create a grand future for fields and homesteads as well as for mills, and mines, and factories.

That steam cultivation will "revolutionize" agriculture has become a common truism; but the phase has a striking significance for all that. Very few years have sufficed to give the farmer an auxiliary force of steam power equal to 40,000 or 50,000 horses: he will require only about seven times this amount to effect his tillage; and the steam plough, being required for every large farm or group of small holdings, awaits a larger and more rapid sale than has been obtained for the thrashing-machine—which is sufficient for the work of many farms together. And, as we shall show presently, the cost price no longer forms too high an investment for the ordinary occupier; so that the substitution of the steam-engine for a portion of the teams may indeed be expected to progress with rapidity as the advantage becomes generally known.

Let us look at the extent of the field waiting for the new power. Our light soils have a very extensive distribution, and their mechanical being scarcely so important as their chymical treatment, steam culture can be only of limited benefit upon them. A flinty chalk sucks its surface dry, a thin stonebrash soil lets the rain run through it; and, except in the weeping North, none of the very light lands are subjected to much tillage, for fear of drought. Hence the slicing of a shallow furrow, paring and stirring by the scarifier and grubber, and solidifying with the seam-presser, form the principal processes of tillage. Except on some moist light earths, in which the couch revels, steam culture will, therefore, make its last conquests in these manure rather than labour-needing districts.

The most extended of our various classes of soil are, perhaps, the friable loams and other lands capable of moderately deep culture. They may be found interspersed both in strong clay and light land districts; they occur upon the drift beds covering various formations—on the green sand, oolite, new red sandstone—and form almost the whole of the alluvial tracts of deep land free from stones. Here is an immense field for steam-power in rooting up foul stubble with the cultivating tine, turning over the clover-lea with share and mouldboard, and subsoiling and trenching, so as to deepen the stratum of staple soil, either by disintegrating the underlying rock or the cemented pan, or by uplifting from a foot depth the subsoil which may need only air and light in order to increase the farm downwards while the area remains unbounded as before. For it is becoming evident in many ways that tillage is the portion of farm art to which the managers of these lands must chiefly look for help. Ammoniacal "artificials" have greatly assisted our corn lands in their difficulty; but though the chemist may declare how many pounds of nitrogen will raise a bushel of wheat, he knows that on soils not rich in native "minerals" the system cannot last long. The more we force and stimulate the robbery of these earthy constituents, the faster are we abstracting the natural fertility of the land; and this must be restored by applications of mineral manure, or else by additions from the subsoil brought up in deep tillage. Neither can the sea-birds' guano nor the phosphoric bone be imported for ever. Again, the stock-farmers are growing more frightened every year at the failure of their winter keep of roots, while the mangold is only a partial and expensive substitute for the turnip; and the soundness of the invaluable bulbs is dependent, in perhaps a principal measure, upon a depth of tilth and due moisture in the summer seed-bed—to be secured only by the avoidance of spring ploughing, which necessitates the practice of autumn fallowing. And it is just this new power of tilling and cleansing land in the couple of busy months during and immediately following harvest that forms one main point of advantage in steam culture. What improved cultivation, what additional crops, what new rotations, what increased yields per acre, are now hindered and sacrificed owing to the infesting presence of the couch, and the impossibility of getting the tillage processes at particular emergencies completed in due time with any force of horse-flesh that the farmer can afford to maintain the year round, we can scarcely estimate at all, except by casting forward an imaginative glance at the husbandry of the future. But we can perceive how a prolific deep culture will be all but universal with the aid of the new draught-power; for in the comparatively few examples hitherto existing of regular 9-inch ploughing, and in the results of 12-inch subsoiling (which from its expense with many horses can only be occasional), every farmer has learnt where lies the secret of great and healthy crops, and how inferior lands may be made equal to the rich. At present two things prevent such deep tillage as 12-inch ploughing in the regular working of whole farms—the insufficiency of the ordinary teams that can be spared for the extra-labour, and the uselessness, or at least after-expensiveness of such driving into the sub-stratum until the upper staple has been cleansed of root-weeds. To keep even the five or six inches at present cultivated tolerably clear from the encumbering and greedy devourers of nutriment stored for our crops, is trial enough for most agriculturists; and they are bold and enterprising who expend money and fatigue their draught animals in deep ploughing and trenching, while the mouldboard inverting the slice, and the long series of horses' hoofs dinting into the furrow, form the best apparatus for planting still deeper the noxious roots which plague the soil above.

Hence it is in better cultivation rendered practicable, more than in greater comparative cheapness of operations, that the gain of steam ploughing will be principally felt. Still the pecuniary saving is considerable; and for these reasons: The engine, never tiring, compresses a larger amount of acres worked into one day, and so forwards the seeding of crops—always a point of great moment, and equivalent to a considerable increase of produce in an unsettled season; its work is of much greater value when done, owing to the thorough division and loosening of the texture of the ground by the rapid motion of the implement, the feeedom from injurious pressure and sledging action upon the under soil, and the soddening and closing up of the interstitial spaces for air and moisture, by the trampling of teams in any but the driest weather; its tillage is deeper and more regular, and, from its superior excellence, has been uniformly found to occasion an increased yield per acre. It commences autumnal cleaning when the teams are carting the harvest, with a process so peculiarly effective that animal power is not able to imitate it, and worth as much per acre as the two or three heavy spring operations it saves. Add also to this list of advantages (any one of which may warrant the purchase of the apparatus on a large holding) the fact of possessing a mechanical power which puts forth a hauling power of 15 to 25 cwt. draught at a speed of three, or three miles and a-half per hour, for as many hours a day as you please, compared with the power of horses limited to 4 up to 12 cwt. draught, at the sluggish pace of two miles an hour, and with long resting times during but eight hours a day. The difference in the amount of work either in area tilled, or depth of culture rendered possible, together with the vastly superior quality and mechanical efficiency of the tillage, cannot be expressed to the practical farmer better than by this statement of applicable force and its speed in motion.

Having explained the numerous sources of advantage from adopting the steam plough on land of medium tenacity—by far the most widely spread of English soils—let us inquire into the exigencies and prospects of the true heavy lands. These are the soils on the London clay, plastic clay, weald clay, gault clay, Oxford clay, blue lias, the clays of the oolite and coal formations, the chalk marl, and drift—all more or less stiff, adhesive, retentive of moisture, and intractable when either wet or dry; in the former state working up into soap or mortar, sticking to and rolling before the plough; in the latter condition hardening into cracked and fissured brick, almost impenetrable by the plough-share. Properly workable only for a short time in autumn, and a less interval during the capricious weather of spring, a great amount of horse-power is obliged to be kept thoughout the whole year, in order to accomplish in the happy moments all the necessary cultivation of this fretful and obstinate soil. Yet this clay has generally a most tantalizing quality, being chymically rich in the mineral constituents of all crops—inexhaustible for corn. Draining, subsoiling, liming, clay-burning, and other costly means of subduing and softening its mechanical texture and ameliorating its properties, are at present but partially practised. In fact, the clay-land farmer is at a ruinous expense for the shallow four or five inch culture which is commonly all he can afford to carry out; and, as he can neither grow roots nor consume them to any extent, he is debarred from stock farming, and must trust the scale of the grain-market for a livelihood. With a prospect only of cheap supplies, no wonder that his outlook for the future should be clouded with misgiving. It is all very well to recommend him live stock, now that cereals do not pay. The difficulty already is to make beef production profitable, even when the resulting manure goes to strengthen the corn crop; and how is he, then, to grow meat alone without grain, unless, indeed, the fields be laid again to pastures and grazing? No one can counsel such a course as supplanting our labouring population with oxen and sheep, while the soil beneath us is full of crops and infinitely more prolific in food for cattle and labour for men than a mere superficies of herbage could be. It is, indeed, a question whether the old tillage-husbandry of England—grain-cropping alternated, balanced, and supported by periodical rests or naked fallows—would not be more profitable (with a modification of the Tullian intercultural tillage between the rows of growing crops) than our present system of raising grain by manure made in the conversion of straw and other produce by uneconomical stock. But whether the new husbandry for strong lands will partake of this character or not, here comes in the steam plough, supplies the means of omni-culture for which we are in distress, relieves our soil from the untold injury of the kneading and pugging feet of the team, cultivates whenever and as much as we choose, and blesses the clays with the perfection of garden manipulation and culture in the growth of the usual farm crops.

We have seen many examples of the transformation in clay husbandry wrought by the agency of steam culture, but none more marked than the operations of Mr. Smith, of Woolston, the well-known inventor, and of Mr. J. H. Langston, M.P., a large landowner in Oxfordshire, who is noted as a first-class agriculturist and breeder of superior shorthorns. Churchill and Sarsden Lodge farms, near Chipping-Norton, embracing 1,200 acres in extent, about 800 of which are arable, form one portion of about 2,000 acres, occupied by Mr. Langston, not in the lavish amateur style, which might adopt the steam plough as a farm luxury, apart from business motives, but farmed with a view to profit, as well as the display of a high order of cultivation; and under the skilful manager, Mr. Savidge, they pay rent like the other farms on the estate, purchase their own new machinery, and answer the expectations of the proprietor. The soil is all heavy; geologically situated on the boundary between the oolite cornbrash and the Oxford clay, a few miles north of Wychwood Forest. The land was formerly a region of woods and bogs, now reclaimed by clearing and deep four-feet drainage, which pierced down, however, to nineteen feet in some cases, for cutting-off springs. The fields were laid in high-backed ridges, found necessary to some extent when ploughing with horses and oxen, but are now levelled by the steam-plough, or in some cases thrown down by spade. In spite of the complete underdrainage, water used to appear in the furrows after excessive downfall, but now that the steam-driven shares have severed the soil to an unwonted depth, not a wet place could be seen after the late heavy rains. Thus, the experience of many other farmers is again confirmed, that, whatever need may exist for the primeval ridge with its water-shed and rain-receptacles under the horse-labour system, there is no doubt as to the safety and superiority of a flat surface when under steam husbandry. The fields are moderately spacious, bounded by neat fences; hilly to some extent, and presenting slopes too formidable for a locomotive or traction engine, though traversed without difficulty by the semi-stationary engine, with its anchor and light wire rope. Good roads compass every field on the farm, and indeed intersect the whole of this large estate—Mr. Langston constructing and repairing all, and the tenantry paying a small acreage rate. Uniform facility for farm traffic is thus secured, in addition to similarity of convenient appliances in the homesteads, in which no less than eleven fixed and portable steam-engines, with their accompanying mechanism, have been erected by the owner. The soil, we said, is heavy, so that, excepting the light summer work, three horses or four oxen are required in turning the usual furrow four to five inches deep—these animals all walking in single line along the bottom of the furrow, to avoid the poaching or detrimental effect of their stepping upon the moist and cohesive surface. Bare fallowing, however, is rarely practised, as green and root crops can be obtained. About three-quarters of a year since Mr. Fowler's machinery, with a ten-horse engine, began its career upon the farm; for three weeks it worked daily without the slightest accident or breakage, and it has been kept in regular and heavy duty, at fitting seasons, up to the present time, in the hands of ordinary labourers, without fracturing the rope or incurring damage or delay of any consequence—the area of work done amounting to more than six hundred acres. Three distinct processes have been performed—common ploughing, eight, and sometimes ten inches in depth, at the rate of five or six acres a-day; crossing ploughed land with grubber-tines, taking a six-feet breadth, accomplishing twelve acres a-day; and breaking up stubble ground for fallow (by the ploughshares, with small wings added) to a depth of quite twelve to fourteen inches without inverting the torn pieces of soil, doing six to nearly seven acres per day; and the engine being self-propelling, travelled of its own accord from one part of the farm to another, having only one horse to guide it—the same horse employed in laying out the rope and fetching coal and water. To show the economy of the steam over the animal draught-work we will allow even a larger force of men than is really needed to manage the apparatus, and suppose them to receive even higher wages than would be the rule in most localities, that is, the labour and the water-carting cost £4 16s. a week. The coal burnt amounts to three tons, at 16s. per ton, which, with oil, &c., at 9s., will make the weekly working expenses £7 13s. How much must be added for wear and tear, or rather for maintaining the machinery in good order and efficiency? On this unctuous soil there are comparatively few stones to grind the rope, and this being made of patent steel wire, of peculiar hardness and flexibility, and therefore capable of bearing far more friction, and sustaining a much greater working load than rope made of iron wire or of inferior steel, will last, with due care, over a great extent of work; and, indeed, in ploughing some hundreds of acres, Mr. Langston's rope has suffered little detriment. However, to be safe in our estimate, we allow £120 a-year, which will buy a whole new rope every year, and leave £52 for repairing the engine and machinery, the prime cost of which was £635. The farms provide thirty weeks' work in a year; and, adding this £4 a-week to the field expenses, we have a total weekly outlay of £11 13s., or say, 40s. a day. A few more figures bring us to the conclusion that the ploughing has cost 7s. to 8s. an acre, the scuffling or cultivating 3s. 6d., and the smashing-up or deep scarifying, 6s. to 7s. per acre. But the comparison (great as it is) of 50 per cent. saving between the ploughing we saw done at 7s. and the same work by horse labour at fully 14s. per acre does not express half the gain upon this strong land. The work, costing but half price, is of far more value when done. We had the corroborative testimony of observant neighbours, that the land steam-ploughed for a seed-bed took two harrowings less to prepare it for the drill—a saving of fully 2s. 6d. per acre over half the farm. In preparing for a fallow crop the advantage is much more surprising. The ordinary tillage by horses, when the ground is tolerably free from couch, consists of one heavy and two lighter ploughings, three scufflings, and twice rolling and harrowing, costing altogether 55s. per acre; by steam there is one breaking up in dry autumn weather, two scufflings, and twice rolling and harrowing by horses as before, costing 27s. per acre. Thus, no less than 28s. an acre upon, say a fifth of the farm, is gained from the superior efficacy of the first process (arising, of course, mainly from the favourable time in which steam-power enables it to be performed). So that the steam plough not only works more cheaply than the horse implements, but renders less tillage altogether necessary to be done. But, still further, the horse work is only five to six inches in depth, while the steam work has riven down into the clay at least ten inches of fair measure from the surface level; and though we might value such an operation, and bring the total gain up to some £2 10s. an acre over this large portion of the farm, the statement would be inadequate to represent its worth, because it is of a character that no team could possibly accomplish, and must be reckoned as a novel addition to all the other tillage processes of the farm, and demonstrate its intrinsic value in a future wealth of roots and corn. The farm has not had time to feel the benefit of its shallow clay staple being converted into a deep strong loam, but illustrations of the change are met with universally on deeply-ploughed lands, in hundreds of cottage gardens and allotments, and in the instances described towards the close of this paper. Ample evidence exists as to the increase of produce upon steam-tilled land, and we hear of improved quality of barley as well as of heavier wheat and far more bulky root crops. The depth and perfection of steam husbandry give not only a greater but more equable grain crop, more free from those failing places which so largely subtract from the total yield of a farm; the earlier ploughing provides a stale seed-bed for spring corn—another sure source of increased produce; and, considering these and other more technical points of improvement and management, no one will challenge as extravagant our judgment that the increase of corn, roots, and artificial grasses will yearly be equivalent to eight bushels of wheat per acre upon half the farm; and, taking this at 40s. a quarter, it will appear that Mr. Langston has probably improved the surplus income or clear profit to arise from his 800 acres arable by nearly £1,500 a year, or about 37s. per acre.

Steam cultivation is not limited to large holdings. Years ago, among those who pondered to good purpose over the splendid results of deep tillage, as manifested in the Marquis of Tweeddale's experience, and more especially in the long-continued succession of exuberant cropping at Lois Weedon, excavated by the trenching tool out of unpromising clay without an ounce of manurial applications, was Mr. William Smith, of Woolston, near Bletchley—a *bona fide* British yeoman, farming his own patrimony, and now developing the inherent merits of an obdurate soil with the same vigorous energy that once distinguished him in the Buckinghamshire chase, though his new system of culture gives no favour to the sportsman's birds, and provides a staple too soft for the foxhunter. Woolston is a corollary from Weedon, and, without following the Tullian method there pursued, successfully obtains on a wider scale and with the aid of steam-power the grand advantages there found to accrue from opening down into a soil with the spade. The locality is between the Dunstable chalk range and the Brickhill and Leighton Buzzard sand hills, the farm (the first whole farm ever cultivated by steam power) resting partly on a stiff calcareous clay, a mixture of lime and mud, containing chalk nodules and veins of sand, and partly also upon a drift of gravelly clay. The arable portion thus consists of two sorts of soil, about 40 acres of heavy, and about 70 acres distinguished as "light"—although turnips never grew well on it for want of thorough tilth, and four horses were used in turning a five-inch furrow. A good under-drainage has long been completed; but dead-fallowing every fourth year, still the system of the neighbourhood, was obliged to be practised. Mr. Smith has succeeded, however, in producing a grubbing implement, which rives and breaks up the soil without under-cutting the whole breadth of its work, thus operating much more economically of power than the plough (which carries such a weight of earth upon its frictional mouldboard), escaping the damaging pressure of the plough-sole upon the subsoil; and much more effectually providing for the extirpation of weeds—by exposing their roots upon the surface, provoking them to germinate for their own destruction, and never burying their seeds and shoots. A double-mouldboard plough is employed for throwing up the ground in drills or ridges of a yard width, exposing a *maximum* of surface to the atmosphere, while the raw clay, bared at the bottom of the intervening trenches, is broken into and crumbled with an admirable subsoiling implement. Indeed, the deep "smashing-up" of land for cleansing, and the growth of pulse crops as well as roots upon the trench-ridges, form the peculiarity of the husbandry, the implements being actuated by steam-power with windlass and wire ropes. A six-course rotation is adopted, the tillage being as follows:—The wheat stubble being little pestered with couch, and so requiring no previous cleansing, receives a covering of 10 tons of farmyard manure immediately after harvest, the manure having been long before carted from the homestead and stacked near the field. The steam trench plough then throws the land into yard-wide ridges, covering in the manure in the interior of the ridges, and baring the subsoil at a depth of 9 inches from the original surface. After lying six weeks to mellow, a double mouldboard plough, drawn by four horses, deepens the trenches to a further depth of four to six inches, and heightens the crests of the ridges, and the fallow lies in this form until spring. Thus we viewed the extraordinary spectacle of the land for next year's root crop, lying for winter weathering, corrugated with ridges of sharp triangular section, which divide the entire area of the field into parallel trenches three feet wide, and no less than two feet deep down the sloping sides, with a torn and crumbled bottom of four to six inches more. A superficial area, equal to at least a third more than the dimensions of the field would allow on the flat, is thus left in open contact with the air, which is at the same time permitted the freest possible access into the ridges and down into the subsoil; and before sowing-time in April and May the frost and other agencies will have changed several inches' thickness of the hard unkindly clay into a powdery mould. The only further process required is cutting the annual weeds from the tops of the ridges with the hand hoe, and then drilling the mangold or turnip seed, which from the absence of all spring tillage possesses, instead of a dried-up seed-bed, a mould replete with the moisture requisite to force its young germs past the reach of the fly, added to a depth which secures the maturity of a weighty crop. Such is the difference between a fine mould wrought down by slow natural weathering and a tilth obtained by the mechanical abrasion and disintegration of scuffling and clod-crushing, that while the latter quickly closes again into a homogeneous mass under a flooding rain and hardening drought, the former (if spared the consolidating pressure of spring cultivation) continues for a long season in its beautiful pulverulent state. Having relieved his land of the heavier horse-power operations, Mr. Smith is not only enabled to grow the finest crops of roots on his fallow, but also to feed off the turnips with sheep carefully folded (with daily shiftings) upon the land; and then by breaking up the soil with the steam trench plough, and afterwards working a horse-grubber across the ridges in spring, the ground is in good order for drilling barley without further preparation. The next year's crop is clover, which is ploughed by horses for the following wheat. The wheat stubbles are manured and tilled in the same manner as for roots; and each ridge is dibbled in spring with two rows of beans, which are preserved from weeds during the summer by horse and hand hoeing. The bean stubbles are prepared for the wheat (forming the final crop of the course) by one smashing up with the steam cultivator, and one (or rarely two) cross grubbings by horses, and after this crop again comes the fallowing for roots as before. Now, according to Mr. Smith's carefully kept accounts, the whole outlay for preparatory tillage from first to last throughout the six years' rotation amounts to only £3 per acre; while under the ordinary system of management only a single year's fallowing (without any crop) costs fully as much. Of course, this enormous saving of expenditure would not be possible if the land were in a foul condition; but, in spite of the first two years of innumerable weeds which annoyed and threatened Mr. Smith at the outset of his non-inversion husbandry, his farm is now as clean as a garden, and his workmen have ample opportunity for looking over the Winter trenches as well as the Summer crops from time to time to destroy such intruding enemies. Until the land becomes clean (which the experience just related shows it will do under this culture) the expenses are somewhat greater, owing to a few more grubbings, splitting the ridges, hand-picking the couch, &c., being rendered necessary. The economy being found so prodigious in the long run, we need not stop to detail the performances of Mr. Smith's eight-horse engine, beyond saying that the labour of 1859 has been 74 acres of various operations in 14 days of working, or an average of about five acres and a-half per day; and, seeing that by horse labour no effective tillage could have been accomplished at all, it is of no moment to ascertain whether or not the engine could compete with a strong team in the amount of hauling power put forth during a day. The condition of the farm, after seven years' commencement of "cultivation," instead of ploughing, and four years of actuating the implements by steam power, is such that a stranger would pronounce the soil to be plethoric with high manuring; whereas mechanical tillage alone is the secret of the present abundant productiveness. Mr. Smith uses no artificial manure, save for purposes of experiment; purchases little oilcake, except to keep his sheep healthy; consumes corn for only a moderate quantity of live stock, and the three horses and pony, which are all the team force needed, and sells off his clover hay. And so far from there being any signs of impoverishment, the most magnificent yields of wheat, beans, and barley are obtained every year, as well as very heavy root crops of most superior quality, the increased produce of corn being considered by Mr. Smith to have been no less than 12 bushels an acre—that is, say, £2 to £3 per acre annually over half the farm. And the practical agriculturist will readily understand that this augmentation of yield, added to the power of keeping live stock created by the new growth of roots and better clovers, must have raised the value of the fee-simple at least £15 per acre, so that the steam plough is clearly one of the "landlord's questions," no less than a tenant's boon. The Woolston farm is certainly an example of the change in texture and physical constitution which intercommunion with the atmosphere can induce in strong soil; the land once so compact and dense is now perceptibly elastic beneath the feet, lighter and more friable, and drying sooner after rain; and this because the husbandman determines to promote absorption and exudation, being as careful in his management of each field in all stages of the weather as a hydropathic patient in the treatment of his skin. Let the soil breathe, and at the same time give it lungs, by making it porous and spongy, with air cells and passages, so that the gases of the atmosphere may freely enter, imparting organic plant food and preparing the mineral elements which lie dormant; and whatever manurial restoratives may be demanded on light lands, our English clays will not need the assistance of Baron Liebig and Mr. Mechi.

In conclusion, let it not be supposed that one description of steam tilling machinery is specially adapted for extensive, and another only for small farms. The cost price of a steam plough ranges from nearly £800 down to almost half this sum; and a considerable number of engines are at work on farms of all sizes, both with Mr. Fowler's and Mr. Smith's apparatus. Mr. Fowler has published 13 reports from purchasers in ten counties, and Messrs. Howard of Bedford (manufacturers of the Woolston implement) have printed 34 reports from employers in 20 counties—the two publications alike embracing the experience of large and other occupiers, on light, medium, and heavy land. The testimony in every case is remarkable as to the quantity of work got forward in each season, the economy and advantage in very many respects, and the proportion of horses dispensed with. These testimonials, however, do not include anything like all the instances of machinery supplied and working in this country.

Then the Continent, the West Indies, and Australia have become customers; and if in the south of France the steam plough might effect a saving of two-thirds in outlay while doing doubly better tillage, in our dear-labour colonies the sugar-grounds and vineyards will show a still greater profit, the machinery being now able to cope with the obstacles of wild lands, seeing that its powerful subsoilers poize up stones and crack tree roots, which master the common horse plough. But whatever immense fields are lying open to the steam plough abroad, we are rapidly progressing with its adoption at home; and should the rotary cultivation, so accordant with theory, never reward the inventors who are seeking it, we are still in a fair way to banish more than a third of, at least, 800,000 farmhorses in Great Britain. With the saved produce of a million and a-half acres (which these hungry teams now consume), added to the eight bushels additional yield on 4,000,000 acres of wheat—to say nothing of the augmented production of vegetable food and butcher's meat, from the yet unforeseen revolution in clay-land management, and on other soils from the interpolation of more than a single crop in one year, and the entire re-modelling of our system of rotations—we may be able before long to feed our population, independent of American prairies, and no longer import supplies equal to a fourth of our harvest.—Times.

LORD PALMERSTON AT ROMSEY.

The Romsey Labourers' Encouragement Association held its anniversary on Dec. 21, 1859, at Romsey, when prizes were awarded for long servitude, ploughing, thatching, and almost every description of agricultural employment. Lord Palmerston, the president of the association, was present, and personally distributed the prizes to the successful candidates in the Town-hall. The award having been made,

Lord PALMERSTON addressed the labourers as follows: My friends, perhaps you will allow me to address a few words to you, to express the great pleasure which I have derived from having to hand over to so many deserving men and women in this neighbourhood these prizes—prizes which are not intended, I need hardly say, as rewards, but as tokens and memorials of your good conduct in your several vocations. I need hardly say that they are not rewards, because no man is so foolish as to think that these tokens of good conduct which are given are intended to be substantial rewards for the conduct on account of which they are bestowed. That is not the principle upon which decorations, and memorials, and tokens are given to mankind for their meritorious conduct. The soldier who hazards his life upon the field of battle, and who has attracted the attention of his superiors and of his comrades by distinguished and heroic bravery, is rewarded by a cross, very insignificant in intrinsic value, but which he wears on his breast as a token and a record of that good conduct which has obtained for him that which is a real reward—namely, the esteem and respect of all around him. In the same way in other classes of life, men who perform distinguished services to the State are rewarded by a little ribbon, which they wear in their button-hole or over their shoulder, but nobody imagines that half a yard or two yards of red or blue ribbon are in themselves intrinsic rewards. They are a token and a record of that good conduct in the life of those on whom they are bestowed which testifies to mankind that they have deserved well of their country. Therefore, my friends, I am delighted that so many of you have received these tokens of your good conduct in your respective vocations; and I am glad to say these rewards have been given for almost every kind of service which an agricultural labourer is capable of performing. We have had prizes for ploughmen, for thatchers, for drillmen, for teammen, for the cultivation of gardens, for keeping cottages neat, and for good service in families where labourers have been employed. And, my friends, without saying anything to flatter you, you may have the satisfaction of reflecting that you belong to a class most deserving of the esteem and respect of their fellow-countrymen, because that labour in which you are employed is at the root and foundation of the wealth and prosperity of a country. It would be a homely saying to tell you a truism—that men cannot work unless they are fed; and that is the last thing I should deem necessary to inculcate in the state of the tables I now look upon: but it is evident that unless the soil, by the labour of those employed on it, shall produce wherewith to maintain those who are occupied in other employments—manufactures, the mechanical arts, the higher arts, and professions—that unless the soil produces an abundance, it would be in vain that industry and ingenuity should combine to increase the wealth and prosperity of the country. Therefore, my friends, you may walk among your fellow-countrymen with a proud and satisfactory consciousness that you are one of the most useful of the classes of the nation, and that without you the superstructure would fall to the ground. Now, my friends, it has pleased Providence to instil into the minds of men a desire to contribute to their temporal and future well-being, and there are few feelings that are more useful than the love of approbation and the fear of censure. But that approbation which men most value on the part of others is the approbation of those who know them—of those who have seen what they have done, or are capable of judging of their merits—of men who come into daily and constant contact with them, and yet testify by their bearing the approbation which their conduct has inspired. Well, then, the prizes which have been given to-day are not only a gratifying memorial to every man when he sees his card stuck up over his cottage fire-place, but they are tokens which, shown publicly to all his neighbourhood, enable him to show that he enjoys the esteem and respect of his fellow-citizens. The fear of censure is also a deterring action, and I am sure that those who are properly inspired with a due love of approbation will never require to be guided in their conduct by the fear of censure from their neighbours; but although there is great value attached to the approbation of others, yet believe me there is no approbation which a man who has a proper estimate of things will more highly value than his own approbation. Other men may be mistaken. They may unduly appreciate conduct which after all, when its motives are known, may not deserve the approbation which it has received. Men may unduly blame others, not knowing exactly the truth of the conduct they blame, and not being aware of all the circumstances which might explain or excuse that which they think fit to condemn; but a man's own conscience never misleads him. He knows full well whether he deserves praise or censure, and if he is conscious that he is deserving of commendation and praise, he may hear with calmness the accents of praise from others, and with composure the censure which he feels not to have deserved. Now, my friends, it is needless among so many who have distinguished themselves in their different vocations to give advice as to their future conduct. You have only to continue to tread in the same path which has led you to be prizemen upon this and upon former occasions. I would, however, remind you that there are, perhaps, functions of life and duties not precisely connected with those kinds of conduct which have distinguished you upon this occasion, but which, nevertheless, are greatly conducive to your wellbeing, and to the respect which you would wish to receive from others. I would particularly impress upon you the great importance of attending to the manner in which you rear your children. Impressions made in early life we all know are lasting, and there are no impressions that go deeper into the mind of a child than those which he receives from his parents in his tender years. Bend the twig as you like, and so the tree will grow. Probably those who are employed out of doors all day long have fewer opportunities than others of attending to the instruction of their children; but you, all of you, have moments which you can devote to that purpose, and you should not omit any opportunity which family intercourse affords you to impress strongly upon your children the distinction between right and wrong. You may be sure that if you attend to the moral and religious instruction of the family that surrounds you, you will see them grow up to be an honour to yourselves, and a comfort to you to the latest days of your life. I am not aware, my friends, that I have anything else to say to you. I am sure that those who have earned these prizes to-day need no advice from others as to the course which they ought to pursue; because I am certain that men who are so much masters of their conduct, of their passions, and of their inclinations, as to have obtained, by a strict attention to their agricultural duties, the rewards which it has been my good fortune to distribute, must also have those high feelings, that deep sense of right and wrong, those high principles of morality and of religion, which will lead them to attend to the rearing of their families, and to their intercourse with their neighbours, without any advice or recommendation from anybody, save perhaps from their religious pastor and preceptor. Again I congratulate you upon the prizes you have obtained; and I have no doubt that next year many who have not been successful competitors to-day will put themselves upon the list of prizemen.

Mr. George called upon the labourers for three cheers for Lady Palmerston, which was cordially responded to.

Lord Palmerston, in acknowledging the compliment, said—I beg to thank you sincerely for the kind and hearty manner in which you have responded to the call just made upon you. I can assure you that these opportunities of meeting familiarly with these whom one does not meet every day in the year are most gratifying to me, and must be to every rightminded man. The fabric of society is constructed by an infinite gradation of ranks and conditions: and those who are perhaps separated from each other, and have not often an occasion of meeting, when the opportunities do occur should meet in order that they may reciprocally understand each other. I am sure that all classes of Englishmen, if they do understand each other, will value and love each other. I am not led away by any national vanity in that opinion, but I have that conviction with regard to the character of my country that I am sure the oftener the different classes of society meet together, the more the whole fabric of society will be cemented the stronger the nation will be, and the more each class will look to the other without jealousy, without suspicion, without enmity, with a conviction that there are no antagonistic interests, but that the interests of all are bound up in one general aggregate which forms the interest of the country at large.

At a later period of the day the members of the Association dined together at the White Horse Inn. Lord Palmerston presided.

The usual loyal toasts having been given,

The Chairman gave "The health of the Members for the County."

The Hon. Ralph Dutton, M.P., in responding, said that, after the able address which had been delivered by Lord Palmerston to the labourers, he would confine his remarks to subjects affecting only the employers of labour. The Romsey Association had been before the public for some years. It had been, as it were, on trial, and what good had it done to benefit the condition of the labourer? For his own part he believed that it had accomplished a vast amount of good, not so much directly as indirectly, inasmuch as it had turned men's minds into the right channel, and had induced them to pay more attention than formerly to the condition of those whom they employed as labourers. Now, he would ask, what was the condition of the English labourer? He was born to his work, like a horse, and the harder he worked the sooner he was worn out. It was clearly, then, the duty of those to whom the Almighty had given a higher station to provide for the labourer in his lifetime, and for his old age also. It could be accomplished in a very simple manner—namely, by giving the labourer good cottages, fair wages, and insuring him work throughout the winter. In that way alone the employer could keep his staff of labourers about him. He knew he might be met by the remark that the supply and demand ought always to regulate each other; but they must remember that that precious text of the political economist almost deprived the farmers of labour last harvest when they wanted it most. He had himself seen many crops standing throughout the hot weather, losing from 25 to 50 per cent. of their value from want of labour to get them in; and in his opinion it arose in a great measure from the evil of not employing a sufficient number of labourers throughout the winter. He believed that there was no outlay upon the land so judicious as the employment of capital liberally. Cottages were now being improved, the labourers were getting fair wages, and he had no doubt that this association, by turning the minds of the employers of labour in that direction, had been the means of doing much good. It would always give him great pleasure to give his humble assistance at that and similar institutions. He believed that the duty of a county member was not merely to attend in his place in Parliament and add his voice to the councils of the State, but to go among his constituents to listen to any suggestions they might have to make, and to encourage those societies which had for their aim and end the social elevation of the people.

The Chairman, in giving "Prosperity to the Romsey Association for the Encouragement of Labourers," said: We are met here as a body of employers, and I hold that these associations affect the interests of the employers quite as much as they do the interests of those who are employed; for it is manifest that no agriculturist can pursue his vocation with advantage if he does not inspire in the minds of those he employs zeal in their calling, energy, industry, and especially good conduct. Agriculture has undergone a great change in the last few years. It used to be a practice; it is now raised to the condition of a science; and no man can be a successful agriculturist who does not raise his mind beyond the mere traditions of those who went before him, and who does not study the principles on which success in agriculture must mainly depend. A farmer ought now to know something, and perhaps not a little, of chemistry. He ought to know what are the ingredients of the soil which different crops take out for their nourishment. He ought to know how, by various manures or by various processes, to restore to the soil those ingredients essential to the growth of plants which former crops have taken out. He ought also, to a certain extent, to know the fundamental principles of political economy, and to be aware that he does not prosper by grinding down those who labour on his farm—that it is no real saving to give inadequate wages to those who work for him—that he gains nothing by avoiding to employ labour in the winter months—and that, in fact, there is no more advantageous and profitable investment in the cultivation of the land than labour. It is quite true that the ingenuity of mechanics has of late years introduced a great number of machines, which, to some extent, are substitutes for the work of the hands; but a farmer ought to know that the use of these machines is not to supersede the employment of labour, but to enable him to divert labour from those processes to which machinery is applicable, and to employ it profitably in other occupations. A great improvement has been made in the intelligence of the labouring classes. Some of us are old enough to remember the time when thrashing machines were held in hatred by the labourer—when all sorts of improvements in machinery were thought to be the means for taking bread out of the mouths of the labourer; but they are now wise enough to know that those processes and machines, instead of superseding labour, are simply an addition to labour. We all know the story of the farmer, who, on his death-bed, told his two sons that he had a great treasure buried in a certain field, and that if they only dug over it they would find it. The sons did dig for it. Money they found not, but money's-worth they did find; and the increased produce of the field by the application of manual labour repaid them amply for their exertions. That story is applicable to all farming occupations. I am sure that I am now addressing an enlightened audience—most of you practical farmers—who must have discovered that it is no economy to spare labour on their farms—that the more labour they are enabled to employ, the more advantage they will derive from the crops; but that the labour cannot be useful unless the labourer is well looked to, well housed, well fed, and well cared for. When the employers of labour bestow proper attention upon their labourers, they engender a feeling of reciprocal regard; and it is in human nature that a man will work better for an employer he loves, and who treats him well, than for a man who is niggardly and churlish, who just pays him as much as will keep body and soul together, and neglects him in other respects.

Mr. **Henderson** proposed "The health of the Chairman," and alluded to the efforts the noble lord had already made to improve the condition of his tenantry and labourers.

Lord **Palmerston** said: I would just briefly advert to one topic which has been alluded to this afternoon—I mean the lodging of the labouring classes. Now it is quite true that Mr. Dutton and myself have built some very good double cottages for the labourers on our own respective properties; but I have heard it said by many that it is all very well for us to do that, but that these buildings are altogether too expensive, that they do not pay, and that other people could not afford to erect them. Now, in the first place, I hold that observation to be founded on a fundamental error. When I build a cottage for a labourer on a farm I do not expect it to pay in money. When I build a good farm house for a tenant I do not expect rent for that house separate from the farm. Well, the cottage for the labourer ought to be looked upon as a part of the appurtenances of a farm, just as much as the buildings for cattle, or any of those other erections essential to the cultivation of the land. How can the land be well cultivated if the labourers are not well housed? If they are obliged to trudge three or four miles in order to get at their work, and the same distance home again, it is manifest that they must be not only exhausted physically, but that their time must be wasted in walking to and from their work, and that the farmer does not get from them their money's worth for the wages he pays. Therefore I consider that in providing a farm with accommodation for the number of labourers to be employed on it, you are giving facilities to the tenant to cultivate his farm, and increasing the value of the farm which you let to a good tenant. If you get a shilling a week from the labourer, it is more to impress upon his mind that he is earning the accommodation you give him, rather than from any idea that he is to repay the expense of the erection. It is not like building houses in a town, which are built to be let at a profitable investment, but it is an addition to the value of the farm; and depend upon it, a good tenant will give you more rent for a farm which he can cultivate to advantage. Then as to the expense of these cottages. Now, the cottages which Mr. Dutton and myself have built contain really no more accommodation than a decent family ought to have. They have simply one room to live in, a back kitchen, and, what is of the utmost importance, three sleeping places. No cottage ought to be without three sleeping-places—one for the man and his wife, another for the girls, and another for the boys. It is not necessary to pull down old cottages to build new ones. A great deal can be done at a moderate expense in improving old ones. All you require is to put a little porch in front of the door, which costs little; to give them a boarded floor instead of bricks; to make the walls air-tight and the roof water-tight; to give three sleeping-rooms; and to put up a sort of shealing at the back, with a little place below for a wood-house. It is quite a mistake to suppose, then, that nothing real and essential can be done in improving the dwellings of the labouring classes short of pulling down the old ones by erecting new ones. The effect of improving these dwellings is almost marvellous. In the first place you know that the comfort of a man's house depends upon the tidiness of his wife, and the mode in which she tries to make him comfortable; but there is a temper of the human mind which is denominated recklessness. When a thing seems impossible it is given up in despair. When a cottage is in such a ramshackle state that it is impossible for the wife to keep it clean, she becomes a slattern, everything goes to ruin, the man is disgusted, and flies to the beer-shop. If, on the contrary, the wife feels that she can, by a little exertion, make the cottage decent and respectable, she does so; and then the man enjoys the comfort and happiness of his home, stays away from the beer-shop, and the sum of money he would spend in liquor goes to the benefit of his wife and children. I had an example of that in a double cottage of my own. It was in a dreadful state. The walls were not air-tight, it had a brick floor, a bad roof, and everything uncomfortable. The people who occupied it were slovens and slatterns, and quarrelsome ill-neighbours. At a small expense it was made tidy; boarded floors were put down, a little porch erected, with a wood-house and other conveniences, and from that moment these people altered entirely their character, altered entirely their conduct, became well-conditioned people and good neighbours, which they had never been before. Therefore, I entreat everybody not to run away with the notion that nothing can be done to improve the dwellings of the poor short of building cottages which they may think too expensive for their means. Depend upon it that a very great deal can be done at a moderate expense towards making old cottages decent and habitable.

The Hon. R. **Dutton** gave "The health of Lady Palmerston," which was cordially responded to.

Lord **Palmerston** then proposed the last toast, "The Press."

The proceedings then terminated.

THE LABOURER'S WELCOME HOME.

The ploughman whistles o'er the furrow,
  The hedger joins the vacant strain,
The woodman sings the woodland thorough,
  The shepherd's pipe delights the plain:
Where'er the anxious eye can roam,
  Or ear receive the jocund pleasure.
    Myriads of beings thronging flock,
  Of Nature's song to join the measure,
    Till, to keep time, the village clock
Sounds sweet the lab'rer's welcome home.

The hearth swept clean, his partner smiling,
  Upon the shining table smokes
The frugal meal: while time beguiling,
  The ale the harmless jest provokes.
Ye inmates of the lofty dome,
  Admire his lot—his children playing,
    To share his smiles around him flock;
  And faithful Tray, since morn, that straying
    Trudged with him, till the village clock
Proclaim'd the lab'rer's welcome home.

The cheering fagot burnt to embers,
  While lares round their vigils keep,
That Pow'r that poor and rich remembers,
  Each thanks, and then retires to sleep;
And now the lark climbs heaven's high dome,
  Fresh from repose, toil's kind reliever;
    And furnished with his daily stock—
  His dog, his staff, his keg, his bever—
    He travels till the village clock
Sounds sweet the lab'rer's welcome home.

THE BEST SUBSTITUTE FOR TURNIPS FOR FEEDING CATTLE.

At the Monthly Meeting of the Haddington Farmers' Club, Mr. SHIRREFF said, that having been most unexpectedly called to the chair in the absence of Mr. Skirving, he hoped the meeting would excuse him for being quite unprepared. Mr. Skirving had sent a letter on the subject, which the Secretary would read. The letter was read, and Mr. Skirving therein stated that he could not account for the present condition of the turnip crop, but hoped that a considerable number of facts would be elicited at the meeting, and by comparing these perhaps some hints for future management might be obtained. He observed that the district of the railway from Dunbar to Edinburgh presented this appearance, that while there is not one single field of good turnips of any variety, there is a great difference as to the extent of the failure, and to his mind that diversity is the most puzzling feature in the case. Near Drem, the swedes, the seed of which had long lain dormant in the utterly dry soil, came up at last without their full natural vigour. If this condition of the plant did not invite the attacks of the various grubs, it at least so retarded their growth as to render their ravages more fatal. He observed at least four different kinds of worms busily at work, and that it is remarkable that the large green caterpiller is always to be found in pairs. But so far as he saw, there is no disease among the swedes about Drem, whilst at Tranent Station they are as utterly gone as the other varieties of turnips. Then, again, the whole of his white and purple-top turnips are diseased, and none of them longer to be seen on the ground, whilst at byres close by they are quite healthy, though very small. He is convinced that it is not the long drought which is the secret cause of this disease. He has some fields sown after the rain which rushed away at once, and indeed nearly the whole of his turnips were most luxuriant and vigorous at the time they were singled. The period of their being sown made no difference. There is one field, portions of which were sown at four different times; they did well at first, all became yellow at once, and drooped their leaves, and died at once, but the dissolution of the younger ones was by far the most rapid. The manure had nothing to do with the disease. This, he thought, was clearly proved by the Club's experiments, which he had tried, together with a portion of farmyard manure alone—all becoming hectic and diseased at one time. He said that a farmer in the county from which he wrote (Dumfries) insists that it is our four-crop rotation which has weakened our turnips, and that the land is sickened by them. This, Mr. Skirving said, is clearly not the case, for why should the crop on one farm be healthy, and that on the farm next be dead, both being managed in exactly the same manner? Besides, two years ago he had a very fine crop. He wished to draw attention to the possibility of the disease arising from the atmosphere acting on some geological peculiarity of the soil. He saw no reason why some peculiarity of soil may not be spotted over our district as the clouds in the sky. Thus, suppose a mass of it to stretch from Longniddry to Portobello—where he observed more disease than anywhere else—and portions of soil with the unknown ingredient are scattered all around, his suggestion is that something else peculiar in the atmosphere combines with that in the soil, and produces the disease. The difference between the turnip disease and the potato disease is striking in this respect, that the potato was struck down equally all over Europe, whilst nothing can be more apparently capricious than the exceptional and eccentric manner in which fields of turnips are struck down. The only practical conclusion we can come to is, that having now seen soft turnips fail more or less for two consecutive years in the lower districts of East Lothian, we must be prepared for the probability of the continuance of the disease for some years to come. It is therefore most fitting that we endeavour to find as many and as good substitutes as we can for a root which has been more at the bottom of agricultural improvement than perhaps any other single thing that could be named. Our attention must be directed to crops of rape sown at various periods to be eaten on the ground, to kohl rabi, to cabbage, to the coarser varieties of potatoes, and above all to mangolds, which never proved their advantages more than during this season, so peculiarly unfitted from want of rain to their growth.

Mr. R. HISLOP, jun., Prestonpans, said he had suffered as much from disease as any one in the county. He had grown turnips, cabbage, and mangold. The cabbage was attacked by the fly as well as the turnips, but the mangold was free. He considered that mangold is suited to a dry soil, that a dry season is favourable to it, and that it is a good crop this season because it was dry. He was satisfied that mangold is the best substitute for turnips.

Mr. SYDSERFF, of Ruchlaw, thought that the discussion was intended to bring out the present exigencies, and that dealers in cake should be asked to say something on the subject. He found that mangold had suffered much this year, and remarked that his crop was far better where it had been transplanted than where it had grown where sown.

Mr. SADLER, Ferrygate, said he had been advised to ask sellers of feeding substances for their opinion, but he thought we should be left to ourselves to find the best substitute. The question is, what are we to feed our cattle with this season? Oilcake is cheap, and we have now straw cutters, steamers, and turnip pulpers to call to our aid. He had tried pulping, and thought that it would interest the meeting to hear his experience of that system, which has been so much recommended in England for its economy of turnips in the feeding of cattle, that one manufacturer alone has sold no less than 4,000 machines. The plan recommended is to mince or grate the turnip into a pulp, which either fresh or fermented is mixed and given to cattle along with cut straw. He then read the following paper containing the details and result of his experiments:—

"This time two years ago I obtained one of the most approved pulpers of the day *on trial,* and I would advise this plan of getting a trial with all new and unknown machines before purchasing. The machine in question was made to pluck the roots into small pieces, without apparently pressing out any of their juices. I selected eight shorthorn cattle bought at Dalkeith Fair, and up to the end of the year fed them upon sliced turnips and a few potatoes. Before being weighed and marked for trial, they were divided as equally as possible into two lots of four each, and for some weeks each lot was fed upon the respective food intended for it during the trial.

"The experiment commenced on the 22nd January, the cattle being in fair thriving condition. They were then all weighed singly upon a steelyard, and notes began to be taken of the food consumed—Lot No. 1 getting sliced swedes ad libitum, with uncut wheat straw, and Lot No. 2 pulped swedes ad libitum, mixed, and given fresh with cut wheat straw, the daily quantity of the latter allowed being 7 lb. per head, or as much as the pulp would amalgamate with, without rendering the mixture over dry. For the first month the lot feeding upon the pulp seemed to take the lead, but ultimately, as will be shown, they did not exhibit any superiority. During the last four weeks of the trial, both lots had an allowance of 4 lb. of oilcake per head daily. The experiment was continued until the 22nd April, when the beasts were all again weighed. The lot on sliced food was found to have consumed in 88 days 25 tons 1 cwt. 2 qrs. of Swedish turnips, and to have increased in weight 7 cwt. 31 lbs., and the lot upon pulp had consumed 23 tons 13 cwt. 1 qr., and had increased in weight 6 cwt. 46 lb.

"The following is a table showing the weight of each beast at the commencement and end of the experiment, and also the improvement on each:—

LOT NO. 1.—FOUR CATTLE ON SLICED SWEDES.

No.	Weight January 22.		Weight April 22.		Increase.	
	Cwt.	lb.	Cwt.	lb.	Cwt.	lb.
1.	9	7	11	28	2	21
2.	7	98	9	42	1	56
3.	9	84	11	94	2	10
4.	9	0	10	56	1	56
	35	77	42	108	7	31

LOT 2.—FOUR CATTLE UPON PULPED SWEDES MIXED WITH CUT STRAW, AND GIVEN FRESH.

No.	Weight January 22. Cwt.	lb.	Weight April 22. Cwt.	lb.	Increase. Cwt.	lb.
1.	9	2	11	14	2	12
2.	9	15	10	77	1	62
3.	9	28	10	84	1	56
4.	8	84	10	0	1	28
	36	17	42	63	6	46

COMPARATIVE RESULTS.

	Lot 1. Sliced swedes.	Lot 2. Pulp. swedes.
	£ s. d.	£ s. d.
Comparative relative value of increase at 6d. per lb.	20 2 6	17 19 0
	Ts. cwt. qr.	Ts. cwt. qr.
Weight of turnips consumed in 88 days	25 1 2	23 13 1
	£ s. d.	£ s. d.
Value of oilcake consumed in 4 weeks	0 10 0	0 10 0
	Tons cwt.	
Extra turnips consumed by lot upon sliced food	1 8	—
	£ s. d.	£ s. d.
Value of extra turnips	0 14 0	—
Cost of slicing, &c., 4d. per head per week	0 16 0	—
Cost of pulping 6d., and cutting straw 1d. per head per week	—	1 11 6
Total for extra food and labour	2 0 0	2 1 6
Return on each lot of turnips consumed, taking increase at 6d. per lb. per week	18 2 6	15 17 6
Payment on turnips per ton, taking value of increase at 6d. per lb. per week	0 14 6	0 13 6

"From the above it would appear that putting the cost of pulping against the saving of turnip, in my case I got one shilling per ton less for the pulped turnips than for those given in the ordinary way. It is to be hoped now, when our roots are so far from plentiful, other experiments may shortly be made upon this subject, as it would be rash to rest satisfied with even one or two trials. We all know that in a lot of beasts, even one animal, from being a dull feeder, would effect a great difference in a trial of this sort, and in future ones it may be desirable to increase the quantity of cut straw, and to add, perhaps, a little linseed gruel to damp the mixture.

"I may mention that a friend of mine in the south of England, who had a good crop of swedes last year, preferred giving them all to his sheep, and feed his oxen entirely on mangold, cake, and barley meal; and, as he observed, he had every reason to be satisfied with the result. I have some idea that he was correct; at least I have always found a better return from sheep than from cattle. Should this be so in general, perhaps the diminution of our turnip crop this season may, like the loss of the potato in Ireland in '46, lead to a profit in the end, by turning our attention to a more profitable method of feeding our cattle than that we have hitherto adopted.

"In England the pulping system has progressed beyond all measure, although we are still without any comparative trials; yet, if we credit the vendors of these machines, something even superior to Thorley's cattle food is being spurned from our feet."

Mr. SHIRREF said that the remarks of Mr. Sadler well deserved attention; there is little doubt the deficiency of our turnip crop can in a great measure be supplied by the use of steamed food. Chopped straw and chaff are great auxiliaries when properly prepared. It is a very serious thing indeed, when our agricultural Club is compelled to consider what are the best auxiliaries to supply the deficiency of our turnip crop. We naturally first turn our minds to trace out the cause of the failure. To him it seemed to be caused partly by the mildness of the winter, and partly by the dryness of the summer, and yet this cannot be the entire cause of the failure of the crop. Some varieties of turnips entirely failed: others again have some chance of still being a tolerable crop. He had noticed that all the hybrid turnips have suffered most from the ravages of the caterpillar and grub. In a field of his own, the contrast between swedes and green-top yellow is most marked. They were sown the same day, and with the same manure. The swedes look healthy, and have a good chance of being a tolerable crop. The hybrid turnips are most thoroughly diseased, and never can be a third of a crop. Luckily the results of last year convinced him that hybrid turnips were more liable to disease, and he had only sown three acres of them this year. The white globe turnips are a good crop compared with the other. We have met to-day to consider how the deficiency of the crop is best to be supplied. The best substitute, could we obtain it cheap enough, is oilcake. It is not dear this year. We must try to purchase our cattle a few pounds cheaper, to enable us to afford our outlay on oilcake. The difficulty is to reconcile dealers to this arrangement, but a deficient turnip crop must make less demand for cattle, and buyers should be cautious.

Mr. DURIE, Standingstane, understood the subject before the Club to be what to grow instead of turnips, but it seemed to him to have merged into what to buy. If we are to have the present emergency supplied, there is nothing in the market just now as good as oilcake at its present price. With respect to Mr. Sadler's last substitute, it is rather a kind of Irish resort to substitute "pulped turnips and straw" for turnips, especially after Mr. Sadler himself has shown the Club that he got 1s. per ton less for pulped turnips. In fact he (Mr. Durie) did not approve of pulping at all, as by it the amount of nourishment in the turnip may be diminished, but cannot be increased, and as it supersedes the process of chewing, which promotes digestion. The animal cannot fatten better on the same weight of roots. But what are we to grow instead of turnips, as they are getting every year more liable to disease? The great cause of the deficiency this year is the want of rain which has produced mildew. It is worst in the low district of this county, where there was most drought; not quite so bad in the middle district, where there is more heavy land, which drought does not affect so much; and in the higher district, where they had more rain, turnips are a fair crop. He thought members ought to try various mixtures of manures, and see if any of them will check the tendency to mildew in dry weather. Last year, where he had mixed ¾ cwt. per acre of nitrate of soda, the mildew almost stopped. He thought the best substitute for turnips is undoubtedly mangold. It requires more manure than turnips, but it grows well on all deep soils, and once brairded it is not liable to disease, and drought has very little effect on it. The only thing against mangold is, that it will not grow well on light turnip soils.

After remarks from various other members, it was agreed to confine the resolutions of the meeting to the present emergency, and to take another opportunity of discussing what is the best substitute for the turnip crop in time to come. It was then moved by Mr. SADLER, seconded by Mr. SHIRREFF, and unanimously agreed to, "That in the present emergency, caused by the deficiency of the turnip crop, the Club recommend experiments to be made in feeding cattle with mangold alone, and also with the various feeding substances now in the market, and that trials be made with steamed cut straw, bran, linseed cake, rape cake, and barleymeal, separately or mixed; and also, although not hitherto successful in Scotland, with pulped turnips, mixed with cut straw."

THE ENGLISH FARMER.—Unfortunately, farmers have, like other people, a greater sense of the faults of others than of their own. They are not conscious of their own want of education and of their own awkwardness in many things; and yet they often entertain a most profound contempt for townspeople. It would be better if they piqued themselves upon their real merits and position rather than on their being able to do a few things which, living as they do in the country, they cannot avoid understanding. They really have a position and a character to maintain, and be proud of. The English farmer is a member of a most important class of society. Living in the country, and in the enjoyment of sun, and air, and fields, and trees, without the wearing routine of labour, which too often blinds the peasant to all these blessings, and makes him walk amongst them as if they were not; removed from all the excitement of city life; enjoying a distinctly marked position, free from the temptation of moving up into a higher grade, and so losing happiness and fortune, and all which makes life sweet and honourable; living in old manor-houses, occupied often from father to son for centuries, with their quiet country church, and honest invigorating recreations, the farmer has the means of being one of the most sober-minded, sensible, independent, and happy men in the realm. If he is not this, it is his own fault, or the fault of parents, or clergymen, or of some external circumstances. He might be an anchor and a principle of steadfastness to his country, and more useful, by far, in his quiet circle, than many bustling men in larger spheres, and of greater pretensions.—*William Blake, by the Rev. W. E. Heygate.*

UTILISATION OF SEWAGE.

I have read with great interest the letter lately published from Mr. J. J. Mechi, of Tiptree Hall, and Baron Liebig, on the question of the sewerage manures of our large towns. Having been for many years largely engaged in the manufacture of artificial manures, my attention has been directed to the waste of valuable substances washed into the rivers and sea from sewers. I found that sewerage contained all the elements of the very best manure—viz., phosphoric acid, nitrogen, ammonia, soda, potash, magnesia, lime, soluble silica, and sulphate of lime, but only in very small proportion to an enormous quantity of water, sand, clay, and iron; and the difficulty and expense of separating the fertilizing substances from the watar, sand, clay, &c., was so great as to make sewerage a most expensive source of supply for the rich elements of a good manure. I entirely agree with Mr. Mechi and Baron Liebig that before many years pass over, other countries will find out their folly in supplying us with bones, and also that at the present rate of consumption, 20 to 30 years will exhaust the deposits of foreign guano, but I by no means agree with these gentlemen that there is any danger whatever that our fields will be barren, and our power of producing food largely at home cease if we are not able to continue to import foreign bones and guano, and apply the sewerage of our towns to the land.

We have other sources of supply of raw material, which contain all the best elements of bones, guano, and sewerage, and we have them in unlimited quantity, and cheaper than sewerage, and even cheaper than guano at its present high price. We already obtain ammonia in large quantity from gas-water. I cannot but look on the coal fields otherwise than as the ancient vegetable world, rich in nitrogen and ammonia. How immense is the quantity of ammonia lost every year in the counties of Durham and Northumberland in the burning of coal for coke, and which might be obtained much easier and cheaper than the ammonia from town sewerage. In the coprolite or fossil bones we have the remains of an ancient animal world, and these coprolites are as rich phosphate of lime or bone earth, as bones of the present day, and are also in deposits which will last for ages to come—in fact, are practically inexhaustible; so we need have no fear for a supply of bones.

We likewise have in the mineral phosphate of lime or apatite of Spain, Norway, and America, immense deposits, far richer in phosphoric acid than either guano, bones, or sewerage. For nitrogen, independent of native sources, there are the extensive natural deposits of nitrate of soda in South America. For soda we decompose salt, for potash the felspar rock. We have lime and magnesia in unlimited natural deposits. Soluble silica can be manufactured to any extent from the fusion of soda and sand, sulphate of lime from the natural gypsum rock. Thus do I maintain that the land and the crops can be supplied with all the elements of the best town sewerage in unlimited quantity, and with no prospect of the exhaustion of the supply, at a much cheaper rate than any known practical mode of converting or applying town sewerage. In my opinion town sewerage is a question more for the towns than for the country; as a sanitary measure the towns must be quit of it, and as a matter of expense they endeavour to do this at as little cost as possible. I feel confident that the day is not distant when it will be found cheaper to carry it liquid into the country and irrigate the fields, than to carry it into the rivers, which take it down with the tide to bring it back on the return of the tide and deposit it on the sides and bottoms, as for instance the Thames. The fact is, farmers can buy all the best elements of sewerage cheaper than have sewerage given them for the carriage. The land *is* the natural receptacle for all town sewerage, and not the rivers; the towns must be quit of their sewerage, they go to enormous expense to carry it into the river, let them try the effect of an equal expense to carry it liquid into the country; if it was brought to the farmer he would willingly pay some moderate sum for it—the river never will pay anything. But in the meantime the country is independent of town sewerage, in all respects both present and future, and the sewerage question is one more for the inhabitants of London and other large cities than it is for the country. S. LANGDALE.

Tyne Manure and Chemical Works,
Newcastle-on-Tyne, December 31, 1859.

Gilston, by Blackshields, Jan. 4, 1860.

When a letter emanates from a great statesman or philosopher, propounding views either of political or social economy, which takes the world by surprise, they are too frequently relied upon by many who would have thought otherwise, had they taken the trouble to apply to them the test of mature consideration and serious reflection. Baron Liebig, in writing to Alderman Mechi on the utilisation of sewage and the ultimate exhaustion of the soil, has put forth statements sufficient to astound the agricultural world, but which, I am sure, they will not subscribe to, not because he reads them a severe lesson on their professional ignorance, but because experience has taught them that his conclusions are hypothetical, and his remarks upon their carelessness and indifference to their best interests unmerited and uncalled for. It is not for a humble individual, as I, to advocate the cause of the farmers of Great Britain, their character for shrewdness, knowledge, indomitable perseverance, patience under misfortune, and the application of all these combined with all that art and science, and the most ungrudging outlay con avail, upon the prosecution and development of their profession, are so well-known, and have been so practically felt even to the utmost ends of the globe, that it were needless to say a word more upon the subject. It has been averred by the greatest agricultural chemist of the day, and one who though he has said some hard things in his letter against the farming community, has their best interests at heart, that, unless the elements of the varied products of our fields which are consumed in our cities and towns, and the sewage of which is entirely wasted and thrown away, be restored, "agriculture must gradually cease." This sewage is therefore to be looked upon as the great panacea to avert this dire calamity. But are we to suppose that even in its collected and judiciously applied state it would be equal to the task of restoring and invigorating the exhausted acres of all the cultivated land in the kingdom? or would it not be more natural to believe that the greatest and most appreciable effects would be apparent chiefly around those manurial emporia, and not at any great distance from them? Previous to the discovery and application of guano and artificial manures to the soil, the inhabitants of Great Britain were living in comfort, they had an adequate supply both of corn and animal food; no doubt they imported largely even then, but now that the population is increasing, their wants so much greater, and their tastes and habits so much in advance of what they were at the period referred to, how are they to be supported, how is famine to be averted, and how is the most refined and civilized nation of the world to be prevented from lapsing into a semi-barbarous state if the forebodings of this great man shall hold true? Ere that period arrive will the agriculturists of the land become less assiduous in their exertions? will the seasons be less propitious? will that bountiful Provider, who has so continuously supplied all their wants, withdraw His blessings, and frown upon their endeavours? and notwithstanding the extension of our colonies, and the race with other nations, is it too much to say that, amid all the explorations which are going on, there will be no further manurial deposits laid bare? If so, then indeed may we stand aghast at the dreadful prospect. But in all that has been advanced on the opposite side, I see no cause for apprehension. We are told that in the United States population is increasing in a greater ratio than the capabilities of the soil can supply their wants; but what do we see in the vast reflux of that population, not only to Ireland, but to other countries? And what does the present prosperous state of Ireland itself demonstrate but the unerring wisdow of the Almighty in adjusting the equipoise between a population and its requirements, and the adaptation of great means to a merciful end? But let us reason a little from analogy. Here is a parent with a numerous offspring—she has expended immense sums on their advancement—she has watched over them with the utmost tenderness, has supported them in trial, preserved them in danger, and at last has the satisfaction of seeing them contented, prosperous, and independent. What has Great Britain done for her colonies? Has she not tended, preserved, and protected them? Is she not developing their immense resources, and affording them the blessing of civilization and industry? And is she a whit the poorer or less thought of for all this? Or would it be too much to expect that in the hour of her extremity (which may she never experience) some one or more of her vast and wealthy colonies would rush to her rescue, and to the supply of her wants? Or if they should be base enough to requite her with ingratitude, can she not, as hitherto, rely with implicit confidence on the bounty of Him who has caused her corn and her wine to abound; and who, as in the body exhausted with toil and anxiety, can call in the aid of Nature, "the best physician," who, by rest, can restore her to her wonted health and strength? And do not the spread of religion, civilization, and education, and the gigantic strides of science, and their applicability to the industrial arts warrant me in asserting that, instead of that sterility which has now been so strongly and strangely prognosticated, the period shall have arrived when the wilderness and the solitary place shall be made glad, and the desert shall rejoice and blossom as the rose? JOHN BALFOUR.

In your paper of the 28th December, there is a long letter from Professor Liebig about the sewage of towns. In it he says, "it has been maintained that the recovering of the manurial elements out of the sewers of large towns is impracticable." No doubt he does not think so: there may be conflicting interests, use and wont, and some other fancies to overcome, but to extract the whole animal, vegetable, and saline substances from the sewage of towns, and leave the water pure and tasteless, is a very simple process.

When great noise was making about the purification of the Thames, I wrote an article on the subject recommending the sewage to be conveyed in large cast-iron pipes to a considerable distance, emptied into tanks built for the purpose, and filled with peat charcoal. The water would pass through it perfectly pure, the charcoal become equal, if not superior to guano; such sized pipes might have been thought chimerical, but such is not the case; I have seen pipes used to supply a city in America with water pumped out of the Ohio into a reservoir one hundred yards long and fifty broad, by one engine. That city contains 200,000 inhabitants, but then the pipes are so very large that the whole city is a reservoir. Instead of using iron, they are building brick sewers in London, which, when once saturated, will diffuse their pestilential effluvia through every part, while old Father Thames will be little better, only the sewage will be carried a little further down.

Peat charcoal could be manufactured easily in every part of Britain and Ireland; and in making it, great quantities of land would be recovered, that are now covered with moss and nearly worthless; besides, the making of the charcoal and the deodorising the sewage would give employment to great numbers of our population; it would deprive Edinburgh of that beneficial effluvia the east wind furnishes her with from her beautiful meadows.

Our farmers are called active, enterprising, and ingenious. Most of the improvements we see have to be forced on them; they have to be forced to leave use and want; see the sewage from every farm running down ditches, the grass growing in them thrice the length of other grass, and for miles from the farm when it has chance to run such a distance. Let some farmer try the sewage of his own farm on peat charcoal—charcoal from wood, ashes, &c.—by constructing a small tank at a convenient distance from his farm, and running all the sewage from house, stables, and byres upon it; one year will convince him he can make a manure equal to what he has been paying £10 a ton for. If he has a horse which unfortunately dies, bury him in the charcoal mass, he is little worth if not worth £2 as bones and manure.

J. HORSEBURGH, Veterinary Surgeon.

Dalkeith, Jan. 2, 1860.

—*North British Agriculturist.*

FARM PRODUCE DESTROYED BY RABBITS.

SMITH *v.* ILDERTON.

This was an arbitration case of damages, held to be sustained by rabbits in the county of Northumberland. It was mutually agreed by the parties interested that the following gentlemen should be appointed arbitrators to assess the damage:—Mr. Thomas Forster, of Swainwood, on the part of Mr. Smith, and Mr. Andrew Bell, of Amble Hope House, on the part of the Rev. Mr. Ilderton. Mr. John Hogg was appointed umpire in the usual way.

The damage took place on Ilderton Dod, in the parish of Ilderton, a valuable stock farm situated on the Cheviots.

Mr. Forster claimed £732 as damages sustained from November, 1857, to November, 1859, and in support of his claim produced the following evidence and calculations founded thereon:—

Edward Donkin, of Southern Knowe, said: I have lived 20 years with Mr. Smith and his father. I have had the management of Ilderton Dod since 1853, when Mr. Smith took it. I am stocksman on his farms. No greater stint has been kept these last two years. The stock has done worse, and more deaths have occurred these few last years. 400 ewes and 300 to 400 hogs were laid on the Dod Hill in the back end of the year. The wool has weighed lighter, particularly the hog wool; 19 fleeces to the weight of 48lbs. This year I think they clipped 1½lbs. less wool. The ewes were sold for less money—4s. a head less—and a big draught sold at 16s. The ewes were from 3s. 6d. to 4s. a head less value for want of meat. The hogs, after being clipped, were from 5s. to 6s. a head less value. Summered on the same place as in former years. This year 280 will be put on turnips or other meat, which I think would have done on the place but for the rabbits. They will cost this season turniping 10s. a head. 200 ewes and 460 hogs were put on Heddon Hill at the back end of the year. A dry season suits this place best. Dry seasons did not affect the meadow. The lambs are fewer in number and very shabby this year. The whole farm keeps 2,000 in general years; it will only keep 1,000 this winter.

Mr. Andrew Bell said: I have known the place for forty years, and had the management of it when Mr. Howey farmed it. Stock never required any extra keep upon it, excepting sometimes 50 or 60 of the worst wedder lambs. The farm is 3s. to 4s. a head worse for sheep. I used to keep 540 ewes, 600 hogs, 540 young sheep, 500 lambs, summered 25 cattle, and 12 horses. I consider the change upon the place to be owing to rabbits. This I know from a field of my own. I consider that the farm was to let on May-day, and all the rabbits killed, would have to be a year without stock to be its usual value. I could winter this year one-half stock upon it.

Mr. Thomas Thompson said: The farm will not winter now one-half what it kept when Mr. Smith took it. By this I mean that part of it is damaged by rabbits. The farm will not be itself for some years.

Hall Turnbull said: I have been 2½ years in my present place as shepherd to Mr. Smith. From Martinmas, 1857, to Martinmas, 1858, the ground was not quite so much damaged by rabbits. The hill I hired was equally bad then as now. The first summer, perhaps, not quite so ill. The hay land is an addition to the pasturage at Heddon. From the 12th Nov., 1859, to May, 1860, if half the stock was kept, they would do badly, and if bad weather came, they must die of poverty. Our meadow was much injured by rabbits; and there was no hay at all near their burrows on the Dean side. Last year there was scarcely any hay at all. I have no sheep upon the place. All the hinds have money wages. The same number of cows are kept by them. The hogs were very poor last May-day, and we had a very bad clip. Several died during the winter, although meat was taken at different places to keep them alive. The ground is not subject to pining. Much the same quantity of stock has been kept upon the place this summer. In 1858 and 1859 the rabbits have been much the same. The meadow, after being dressed last six weeks, was as bare as just now. I consider that the rabbits during these two years have eaten more than Mr. Smith's sheep. I consider the stock upon the place has been nothing like my neighbours'; nothing but poverty and death among them. 120 ewes were sold at Wooler Fair at 22s., and 27 at 16s.; some could not be shown in consequence of being so lean. They are sold at five years old.

George Davison said: I lived near the Dod all my life. I have lived at Greenside 21 years. I have often been on the Dod these two last years. I considered the farm much worse. As far as I know Mr. Smith has stocked it less than Mr. Neil did when he farmed it. The Flint Hill Meadow has been hay since Mr. Smith got the place. I have known 40 pikes of hay taken off it; about 20 tons. I think it is four years since there was any hay upon it. The present meadow was under crop when Mr. Neil had it. I consider that the ground this year, if there is a bad winter, will keep very little, if any, stock. I think this damage has been done by rabbits. I never saw land eaten in such a manner by them. There is scarcely a bit of grass left. There is a great increase of rabbits since Mr. Smith came; there has always been rabbits, but nothing to what they are now. There was always plenty of meat upon the farm when Mr. Neil had it, and I believe the place had more stock upon it then. There has been, in my opinion, an increase of 30 rabbits to 1 since Mr. Smith got the place. There were some of the ewes sold at Wooler a perfect shame to be seen. The injury has not been done by pining; I never knew such a thing on the place. I attribute the decrease in the value of stock to rabbits. There were never any of Mr. Neil's stock shifted in winter off the farm. If I had my wage off such a place in sheep, I think I might die and the sheep too.

Mr. Gibson, of Freestone Burn, said: I have known this farm all my life. I have often seen the stock these last two years. My farm and the Dod join. I have noticed great depreciation in the value of the stock these last two years. They are much worse than their neighbours'. The ewes should have been as good at the beginning of lambing time as they are just now. Mr. Smith has had less than the usual quantity of stock upon Heddon since he took the farm. The hog wool weighed 13 and 14 fleeces to the weight of 48lbs. On the Dod last year there should have been 13 and 14 fleeces to the weight. It should average 15 fleeces in general years. The farm is in such a state that I would not put my sheep upon it if I might for nothing. Rabbits are, in my opinion, the sole cause of the bad sheep. Sheep would not eat the grass in such a way. There had been a great increase of rabbits since Mr. Smith took it.

On the part of the Rev. Mr. Ilderton, Mr. Bell brought forward the following evidence:—

Joseph Turnbull: I came with Mr. Smith to the farm. I herded Dod Hill and Flint Hill, but had nothing to do with Heddon. There was less stock kept in 1858. We hardly knew what stock was regularly kept; stock often changed. The rabbits were, I think, as numerous the second year Mr. Smith had the place as at any other time I was there. I know nothing of how they were upon Heddon. Mr. Smith never complained to me of the rabbits, and I never complained to my master, Mr. Smith. The upper part of the Dod Hill is more barren now than it used to be. I know nothing of what stock has been kept upon the farm since I left in May, 1859. I can say nothing of what rabbits the keepers caught. As many rabbits on the part I herded the second year for Mr. Smith were there as in any other year. We got as much as our neighbours for the stock in general years. I considered that there was more spring meat upon this farm than on any other of Mr. Smith's farms. The sheep went very little into the Dean in summer, more during the winter. There was a good deal of grass in the Dean on the 12th of May. I never had any quarrel with the keepers. My lot of sheep got the scab. Mr. Smith and myself had words. I have a house at Hartside, but no herding. I decline answering what rabbits I got from the keepers.

John Anderson: I have been keeper to Rev. Mr. Ilderton for six years. Mr. Smith had the farm half-a-year before I went to Ilderton. I have often had complaints of the rabbits these two years. I have had no quarrel with the shepherd. Rabbits were more numerous these last two years; there has been a general increase there two fine seasons. There were always more rabbits on the Dod farm than on any other part of the estate. They were killed by me or my men when complained of during the summer on the tillage farms, but were not killed upon the Dod until winter. Mr. Smith never desired me to do so. I seldom saw Mr. Smith. Lots of small rabbits were thrown away during the summer, and never put into any account.

Alexander Stephenson said: I have been engaged eight years killing rabbits on the Ilderton estate. There are more this season on account of the weather. 1854—the severe winter—greatly reduced them. There has been much the same quantity of rabbits on the place since I knew it. I do not know the number of sheep kept, but I think more were kept this summer. I noticed them much thicker. The ewes had to be herded to be kept on the inner hill. We have done all we could to kill the rabbits.

Mr. Leighton said: I am agent to the Rev. Mr. Ilderton. Mr. Smith complained to me about the rabbits in May, 1857, and again in November, 1857, and Mr. Ilderton engaged to pay for damages. In November, 1858, Mr. Smith kept from his rent £200 for damages. This he afterwards paid at my request. He claimed to May, 1857, £200, as damages done by rabbits.

The following letter was read by Mr. Forster, from Mr. Robert Shield, of Sourhope, who viewed the farm on the Monday previous, but was unable to attend to give his evidence verbally:—

"Dear Sir.—After further consideration about the state of the grass land on the two hills which we were talking over on Monday last at Ilderton Dod, I think that fully half of the present stock should be taken off Heddon Hill from the present time to Whitsunday next. I am informed that there are 200 hogs already removed from the Dod Hill; and looking at the grass on the hill and comparing it with other hog grounds, I think it would require as many more to be taken from the hill for the present winter. Though these sheep were removed for the winter, and the rabbits all caught, I don't think the hill will be as good as formerly for some years. I understand Mr. Smith has lost a good many hogs from braxy upon the Dod Hill, which I apprehend has been caused by the rabbits upon the hill.—Yours, &c., ROBERT SHIELD."

Mr. Bell offered as a compensation for the damage Mr. Smith had sustained, £60.

This concluded the business, it being understood that Mr. Forster was to forward to Mr. Hogg, the umpire, in a day or two, the calculations upon which he founded his demand.

Copy of Mr. Forster's estimate of the loss sustained by Mr. Smith on his farm at Ilderton Dod by rabbits, from Nov. 12, 1857, to Nov. 12, 1859:—

Loss on 600 ewes, by depreciation in value of themselves, their wool, and their lambs, from

November 12th 1857, to November 12th, 1858, at 2s. 6d. a head.	£75	0	0
Loss from the 600 ewes from the same cause, but to a greater extent, from November 12, 1858, to November 12, 1859, at 3s. 6d. a head. ..	105	0	0
Loss from the removal of 300 ewes from the farm, rendered necessary by their winter food being destroyed by rabbits during the summer of 1859, at 5s. a head	75	0	0
Loss by 800 hogs for their keep off the farm, their bad clip of wool, and their depreciation in value, caused by rabbits, at 3s. 6d. a head, from August, 1857, to June, 1858, when they were removed to a part of the farm not infested by rabbits	143	0	0
Loss by 810 hogs, on account of hired keep, by a depreciation in the weight and value of their wool, and by a depreciation in their value when clipped, from August, 1858, to June, 1859, when they were removed to ground free from rabbits, at 5s. a head	202	10	0
Loss by the winter keep of 280 hogs, their usual keep on the farm being destroyed by rabbits during last summer through, up to May, will cost at 8s. a head	112	0	0
Loss on the hay ground for two years, caused by rabbits	20	0	0
Total	£732	10	0

Mr. Hogg, after taking a few days for consideration, awarded £90 to Mr. Smith as damages, the expense of the arbitration (£14) to be paid equally by the parties interested.—*Berwick Warder.*

IMPORTANT TO FARMERS & GRAZIERS.

At the Shire-hall, in this town, before W. B. Lloyd, Esq., and Sir V. R. Corbet, William Lloyd, of Old Heath Gate, appeared on a summons charging him with demanding toll from Mr. Matthew Williams, of Uffington, on the 3rd of November last, after Mr. Williams had claimed exemption. Mr. Sprott having stated the case, called Mr. Williams, who stated that he is a farmer, residing at Uffington, and that he held land near to the Old Heath turnpike-gate, and at Coton-hill. He had sheep in the land at Old Heath. On the 2nd of November he gave orders for a change of pasture, and on the 3rd his man took the sheep. Mr. Williams saw defendant at the gate, who demanded toll for the eighty-five sheep; but as they were going to land in his occupation near Cross-hill he claimed exemption accordingly. As defendant persisted in being paid, Mr. Williams paid him at the rate of 5d. a score; and, having had a deal of unpleasantness with defendant, and, until the matter was settled, was likely to have more, he summoned him to see whether he really was liable to pay toll for cattle, on change of pasture, or not. After a few irrelevant questions put to Mr. Williams by defendant, he produced the private Act of the Preston Brockhurst road (59th Geo. III.), according to which, he stated, Mr. Williams was certainly liable to toll, on the ground that the sheep had been driven through other parishes than that in which Mr. Williams resided. Upon the clause on which Mr. Williams claimed exemption being pointed out to the magistrates, they understood the act to say that "any horse or cattle going to or returning from water or pasture, or going to or returning from being shod or farried," were evidently exempt from toll if they passed through twenty parishes; but that, under the Public Turnpike Act, they were liable to toll if driven for above two miles along such road. Mr. W. B. Lloyd said he knew that, when he himself held land in the neighbourhood of the Old Heath, he had cattle regularly driven from his farm, and which had to pass through the same gate and through several parishes, but never paid any toll for them. After some few further remarks from defendant, he was told that he had evidently committed the offence he was charged with, and was fined £1 including costs. Distress warrant to issue, and, in default of sufficient distress, to go to gaol for three months.—*Shrewsbury Chronicle.*

TITHE COMMUTATION: SEPTENNIAL AVERAGES.

SIR,—As many of your readers may feel anxious to know the result of the corn averages for the *seven years* to Christmas, 1859, published by authority in the *London Gazette* of this evening, viz.,

Wheat.... 7s. 4½d. per imperial bushel
Barley.... 4s. 6½d. ,,
Oats . .... 3s. 1¼d. ,,

I beg to state for their information that each £100 of tithe rent-charge will, for the year 1860, amount to £110 17s. 8½d., which is nearly 2 per cent. above the last year's value, which was itself the highest of the 23 preceding years. The value for 1855 was only £89 15s. 8¾d., or 21 per cent. *below* the value for the current year.

The following statement from my "Annual Tithe Commutation Tables" will show the worth of £100 of tithe rent-charge for each year since the passing of the Tithe Commutation Act, viz.:

FOR THE YEAR	£	s.	d.
1837	98	13	9¾
1838	97	7	11
1839	95	7	9
1840	98	15	9½
1841	102	12	5¼
1842	105	8	2¾
1843	105	12	2¼
1844	104	3	5¼
1845	103	17	11¼
1846	102	17	8¾
1847	99	18	10¼
1848	102	1	0
1849	100	3	7¾
1850	98	16	10
1851	96	11	4¾
1852	93	16	11¼
1853	91	13	5¾
1854	90	19	5
1855	89	15	8¾
1856	93	18	1¼
1857	99	13	7¼
1858	105	16	3½
1859	108	19	6¼
1860	110	17	8½
24)	2,397	19	9
General average for 24 years..	£99	18	3¾

I am, sir, your most obedient servant,
CHARLES M. WILICH, Actuary
University Life Assurance Society.
25, *Suffolk-street, Pall Mall East, S.W.,*
January 6th, 1860.

GOD SPEED THE PLOUGH.

God speed the plough-share! tell me not
Disgrace attends the toil
Of those who plough the dark green sod,
Or till the fruitful soil.
Why should the honest ploughman shrink
From mingling in the van
Of learning and of wisdom? since
'Tis mind that makes the man.

God speed the plough-share, and the hands
That till the fruitful earth,
For there is in this world so wide
No gem like honest worth.
And though the hands are dark with toil
And flushed the manly brow,
It matters not, for God will bless
The labours of the plough.

THE EXTENT OF CRIME IN ENGLAND AND WALES.

From the two following lists it will be at once perceived in which police districts the numbers of the known criminal classes in proportion to the population are above the average for England and Wales, and in which counties the numbers fall below the average. The average for the entire population being one criminal to every 137 persons, it follows that—

ABOVE THE AVERAGE. Are	Proportion to Population.	BELOW THE AVERAGE. Are	Proportion to Population.
1. Warwick	1 in every 55	22. Wilts	1 in every 140
2. Southampton	— 55	23. Suffolk	— 145
3. Rutland	— 58	24. Surrey	— 153
4. Nottinghm	— 66	25. Durham	— 156
5. Worcester.	— 66	26. Wales	— 159
6. Bedford	— 72	27. Hereford	— 164
7. Bucks	— 72	28. Somerset	— 166
8. Berks	— 79	29. Lancashire	— 170
9. Stafford	— 81	30. Metropolis	— 176
10. Dorset	— 85	31. Gloucester	— 177
11. Herts	— 89	32. Salop	— 181
12. Cambridge	— 89	33. Kent	— 186
13. Leicester	— 89	34. Northumberland	— 197
14. Essex	— 92	35. Cumberlnd	— 198
15. Norfolk	— 96	36. Westmore-	— 201
16. Monmouth	— 108	37. Northampton	— 216
17. Derby	— 115	38. Cheshire	— 219
18. Huntingdn	— 116	39. Oxford	— 230
19. Sussex	— 117	40. York	— 233
20. Devon	— 134	41. Cornwall	— 262
21. Lincoln	— 136		

In the next place, the police districts may be arranged according to the proportion to the population, of the total number of persons in each county judicially proceeded against, either summarily or upon indictment, in the year 1858. The average for England and Wales is 1 act of procedure to every 41 of the inhabitants. Hence, it follows that the first 8 counties are above the average proportion, and the last 33 are below it:—

ABOVE THE AVERAGE.

	Proportion.		Proportion.
1. Metropolitan tistrict	1 in 23	5. Stafford	1 in 32
2. Lancashire	— 24	6. Monmouth	— 35
3. Durham	— 27	7. Cheshire	— 39
4. Northumberland	— 30	8. Salop	— 40

BELOW THE AVERAGE.

	Proportion.		Proportion.
9. Somersetshire	1 in 47	26. Cambridge	1 in 69
10. York	— 47	27. Lincoln	— 71
11. Worcester	— 48	28. Northampton	— 71
12. Wales	— 49	29. Westmoreland	— 72
13. Huntingdon	— 55	30. Kent	— 75
14. Nottingham	— 55	31. Oxford	— 78
15. Cumberland	— 56	32. Bedford	— 83
16. Gloucester	— 58	33. Suffolk	— 89
17. Surrey	— 58	34. Norfolk	— 90
18. Berks	— 59	35. Cornwall	— 92
19. Hereford	— 59	36. Devon	— 94
20. Southampton	— 59	37. Essex	— 94
21. Warwick	— 60	38. Wilts	— 97
22. Leicester	— 61	39. Rutland	— 98
23. Berks	— 63	40. Sussex	— 98
24. Herts	— 64	41. Dorset	— 133
25. Derby	— 66		

It requires but a superficial consideration of these two lists, and a comparison of both with the statistics from which they are derived, to perceive—although our ignorance of a certain integral portion of our population is less great than formerly—how little we really know of our criminal classes. Both the above tables possess a certain specific value of their own. Both are, to a certain point, indicative of the extent of crime. —*The Economist.*

MESSRS. PEEK AND COMPANY'S AERATED-BREAD MANUFACTORY, AT DOCKHEAD.

A number of gentlemen having received cards of invitation to inspect the above establishment, on Wednesday, Dec. 18, met there at one o'clock, and were received by Dr. Dauglish, the inventor and patentee of the process, who explained to the company the nature of the machinery and the methods employed in the manufacture.

On entering the extensive premises, the first thing that strikes the eye is the steam-engine (of twenty-horse power); to which are attached, by the usual wheels and pinions, the shafts employed in working the machinery. Next, on the ground-floor, is a large globular vessel for the reception of flour, which is conveyed into it from the floor above, by a canvass bag. The globe itself is capable of being made perfectly air-tight, being closed by stop-cocks. Above it is a long cylindrical vessel for holding the water used in the process. Connected with this vessel is a pipe, for conveying fixed-air (carbonic acid) into the water; and by the side of this cylinder is a water-gauge, for regulating the quantity of water let into the globe.

The flour (280lbs.) and salt being let into the globe, the atmospheric air is drawn off by an air-pump; this being effected, the water charged with the requisite proportion of fixed air is then discharged into the globe, which is furnished with a horizontal axis, to which arms are attached for mixing the materials. This axis rotates at the rate of 72 revolutions per minute; and everything being ready, it is set in motion, and so quick is the process of kneading performed, that in a period varying from three to ten minutes the process is complete, and the dough ready to be moulded into loaves.

At the bottom of the globular mixer is a short piece of pipe, through which the dough passes in a slow, but continuous stream. A boy is stationed at this pipe, and with an oblong box receives the necessary quantity of the dough (2lbs. 4oz.), which he cuts off with a knife: he then hands the box to another boy, who weighs it and then turns it out upon an iron moveable platform, which takes it at once into the oven, called "a travelling oven," the bottom being an endless chain revolving upon two drums, which regulate its speed. The loaves enter at one end of the oven, and are taken out at the other, the process of baking requiring 40 minutes. The whole process, from the passing of the flour into the globe to the exit of the bread from the oven, not occupying more than *one-fortieth part* of the time required by the usual mode of bread-baking—and this without a hand or foot having touched it. The quantity of bread turned out by this process at Messrs. Peek's establishment is about 2 sacks per hour, yielding 192 two-pound loaves to each sack of flour. They can therefore send into the market at the rate of 250 sacks, converted into bread, per week.

The manufacture of biscuit, especially the fancy biscuits, is the most ingenious and beautiful application of machinery we have ever seen. The dough having been made in the same expeditious manner as for bread-making, is passed under a roller, which reduces it to the required thickness. It then moves forward on an endless platform, under a set of dies or stamps, highly polished, which cut the biscuits the size and form of the die. Still moving forward, they pass under a cylinder towards the oven; but the stringy remains of the dough, from the cutting, pass over the revolving cylinder, and deposits itself into a tub or box placed on the other side for that purpose. All these processes, like those in bread-baking, are executed by machinery alone, and without the hand of man, until the biscuits emerge from the oven, when they are dried by the usual process in a room appropriated to the purpose.

Many questions were asked and much valuable information elicited from Dr. Dauglish, the patentee, on the valuable properties of the bread thus made. One gentleman, however, from the Post-office, stated that he had requested a large number of the men employed at that establishment (of whom there are 800) to use the aërated bread for a certain time, and report to him upon its nutritive properties as compared with the common bread. The result was that all except one of them found the bread more nutritive, and that it kept fresh much longer, than common bread, and was also more pleasant to the taste.

A cold collation was provided for the company in one of the floors of the building, at which Dr. Lancaster presided. Some excellent speeches were delivered by the chairman, Dr. Dauglish, Mr. Peek, and other gentlemen, and the company generally expressed themselves highly gratified with the view of the establishment, and perfectly convinced of the superiority of the plan to the common mode of making bread and biscuit.

THE TRADE BETWEEN ENGLAND AND FRANCE.

The avowed new policy of the French Emperor has necessarily directed attention to the present and future of our trade with France, and it may be well therefore to glance at the details—as far at least as relates to those articles and products in which our readers are specially interested. The total value of our direct British exports to France, exclusive of her Colonial possessions, which in 1854 was but a little over £3,000,000, sprung up in the three following years to over £6,000,000, but dropped again in 1858 to below £5,000,000. The imports of French goods, on the contrary, which had averaged in value about £10,000,000 in the three years ending in 1856, increased to nearly £12,000,000 in 1857, and rose to £13,272,000 in 1858.

Entering now more closely into the examination of the trade between the two countries, we find firstly that we have imported from thence the following live stock :

	Oxen and Bulls.	Cows and Calves.	Horses.
1854	3561	2709	2292
1855	2182	1158	744
1856	1487	793	936
1857	1909	657	703
1858	1873	1452	781

But we sent to France in return in the five years 8,142 horses, valued, according to the Parliamentary returns, at £424,722 ; while the 5,456 horses we received from them were only valued at £133,429.

The import of French butter, which in 1854 stood at 45,656 cwt., had dropped in 1858 to £28,028. Eggs have always been a large article of shipment from France, and we continue to draw from thence increased supplies yearly, as they are in large demand not only as food, but for manufacturing uses. In 1858 the quantity is stated at 598,003 cubic feet, equal to nearly 120 millions, of the value of £269,000—a very large sum to be disbursed for eggs, more than France pays us for machinery of all kinds, and half as much as she pays to British merchants for the whole of the iron she takes. Of grain and meal we took from France in 1858 818,251 qrs. of wheat and 411,156 qrs. of other grain, and 1,628,248 cwt. of flour. This last was an exceptional instance, being five times the quantity of flour we had imported from France in any of the four previous years.

We have drawn from France large quantities of flax lately, the import having sprung up from 7,208 cwts. in 1854 to 24,857 cwts. in 1857, and 31,579 cwts. in 1858. Of raw hides we take, on the average, 7,000 or 8,000 cwts.; but in 1857 we bought of them more than double that quantity. Dressed hides average about a million pounds weight. We have been taking of late years less madder and madder-root ; but of the prepared dye-stuff, garancine, the imports are larger. Of rape-oil we take now as much as 3,600 tuns annually, valued at £158,546. Of oil and cakes we received 9,655 tons in 1858, of the value of £80,479 ; showing a gradual decline since 1855, when the imports were 19,315 tons. Owing to the large quantity of oil-seeds now crushed in this country, it is probable that a larger quantity of cake is made and sold here.

We only imported 3,260 cwts. of salt pork, as compared with 15,000 to 20,000 cwts. in previous years. The imports of tallow are large, from 23,000 to 30,000 cwts. The imports of sugar have been large from France, and beet-root sugar would seem to be finding its way more commonly here. The imports of raw in 1858 reached 390,289 cwts., and of refined 66,703 cwts. There was an enormous quantity of potatoes received from the French ports, reaching to upwards of 54,000 tons in 1858, while in previous years it had been merely nominal. The imports of seeds, clover, grass, and trefoil reached 68,287 cwts. Of wool we only import small quantities from France, seldom exceeding a quarter of a million pounds; although 1857 was an exception, when we drew from thence nearly a million. Lastly, we come to wine and spirits. The imports of wine show a sensible decrease from 1,000,000 gallons in 1854, to 623,000 in 1858. Whether this arises from decreased production and manufacture in France, or decreased demand and consumption here, we cannot state. Brandy shows a like enormous decrease. While the exports of brandy to this country in 1854 were nearly 3,000,000 gallons, in 1858 they were only 1,000,000.

Thus much for our imports from France : let us see what the French take from us in return. In the shape of agricultural produce little or nothing. They used to take some 6,000 or 7,000 barrels of beef and pork, but these have dwindled to 237 ; 5,000 to 6,000 cwts. of lard have dropped to 75. About 11,000,000 pounds of wool and 11,000 cwts. of dressed flax constitute all the rest. The remainder of the shipments consist of limited quantities of our manufactures. They are dependent on us for a million and a quarter tons of coal, the increasing wants of their steam-navy necessitating additional foreign supplies. They take cotton manufactures to the value of £300,000. Of iron they took above £1,000,000 in value in 1856, and only £533,000 in 1858. Linen manufactures £150,000, silk manufactures £550,000, and woollen ditto about £500,000, constitute the other chief exports. What extension may arise from the proposed new official regulations it is difficult to predict, but it is to be hoped that our trade and manufactures may be more benefited than they have been by the very restricted commerce hitherto carried on between two such wealthy and populous neighbours.

Mr. G. D. Badham has sold his Suffolk stallion Redshank, by the Old Duke, out of Chester Emperor's dam, to go to the Cape of Good Hope.

THE STEAM PLOUGH

A good climate and a good soil will not always give good crops, unless the culture be also good. As for our English climate, we must take it as it is. If it is to be modified by extensive drainage and by the gradual growth of newly-planted forests, the process will be a long one at the best. As for soil, we have almost all varieties, many of which we might wish were better than they are. When we come to consider the purpose and nature of soils, we perceive many ways in which their character may be improved. One great purpose of the soil is that of a foundation in which plants may fix their roots, without which support there could be no useful growth. It is not every soil, however, that will meet even this condition, although there are very few which will not do so after more or less mechanical treatment. Another great purpose of the soil is the supply of certain mineral elements essential to the growth and maturity of plants. Wheat would not stand, for instance, but for the firm enamel which protects its stalk, and which, when divided so as to expose a sharp edge, will cut almost like a knife. This enamel is chiefly silica, which must have existed in the soil on which the stalk was grown, and if the stalk be burnt all the silica will be found in the ashy residuum—the ashes left, after burning a plant containing all the mineral elements which originally left the soil to enter into the structure of that plant. It is in the study of soils—and the study is not difficult—that agriculturists may know the exact nature of their land, and, with proper regard to climate, what it can grow and what it cannot grow. They can learn in what elements it is deficient, and are often enabled, by a little sanding of clay soils, or by claying light soils, as well as by manuring, to bring very refractory land into profitable cultivation. Farmers have made vast progress in knowledge of this kind, although there was a time, and it was not so very long ago either, when to have propounded the simplest theories of the nature of the soil would have brought ridicule upon the propounder. At the present time, however, whilst there is no question of the value of manures, and no want of assiduity on the part of Baron Liebig and Mr. Mechi in urging their necessity, we are inclined to believe that the modern school of agriculture is entailing needless expense upon our farmers, who, in their passion for sulphates, phosphates, and fixed ammonia, are sending altogether too much money to Peru. We believe that a proper mechanical treatment of our clay soils will do more to increase our national production than all the guano of the Chincha Islands can ever accomplish. What is wanted is the breaking and thorough comminution of our heavy lands to a depth of from 18 in. to 2 ft., when they will absorb ammonia from the atmosphere, and if anything more is needed it is cheaper to procure sand than guano, whilst as for sulphates and phosphates we must learn to collect and apply our town sewage. Potatoes are grown upon the barren sands of Ayrshire, with no other nutriment from the soil than that supplied by a dressing of the liquid sewage of Glasgow. Our clays, which are generally much deeper than any cultivation is likely to extend, contain unknown stores of fertilizing elements, the value of which has been proved on the Tweeddale estate and at Lois Weedon and Woolston, as well as on many farms in other parts of the kingdom.

Say what we may of steam-ploughing, its great value is in the opportunity which it affords of opening the soil to a depth altogether unknown in the agriculture of the past. The power of exerting a draught of 25 cwt., at 3½ miles an hour (some 26 "effective" horse power), is one which is not merely a matter of increased acreage, nor does the comparison end with that of the cost of coal and wire rope on the one hand, and of feed and attendance on the other. For, more than this view discloses, the steam-plough does what the horse-plough can never do, limited as it practically is to 6 in. furrows, in heavy land. We do not think that farmers have yet got beyond the comparison of the two systems by the superficial area of work done and the outlay required in a day's ploughing. It is true that this contrast is already sufficient to decide the question in favour of steam, but the advantages of steam power are not even then so great as to induce every tenant of a moderate or even a large holding to put his hand in his pocket for from £500 to £800, required for an engine and tackle. In time, however, he will come to understand that the steam-plough will bring up something a foot down in the clay which is quite as good as guano—and he will then discover that the soil which has in some places been cropped for nearly a thousand years without "fertilisers" is good for another thousand if it be brought to daylight, and if the millions of pores and interstitial spaces—which are nature's own lungs, and which must exist in some shape wherever there is growth—be allowed to breathe the air, the vital food of plants, charged with the carbonic acid and ammonia which, with water and a small quantity of inorganic matter from the soil, make up the whole substance of vegetable growths. To a plain farmer, this must be translated as meaning that his heavy lands will feed all the crops which can stand upon them, provided the soil be thrown open, so as to allow the air, the rain, and the roots to come together, deep below the surface. Perhaps no soil on the globe would be richer than one composed of the clays and sands of this island, mixed, and thoroughly pulverized a foot deep. In soils which are already identical with what such mixture and treatment would produce, eight and nine quarters of wheat have been raised on the acre; and, it is only a simple calculation which proves to us that if the best husbandry were extended over the whole area now under cultivation in Great Britain, our grain crops, and our production of beef and mutton would be doubled. Something like 50,000-horse power of agricultural engines are already at work in the kingdom; but their employment in the barn-yard bears no comparison in productive value to that which would attend their removal to the field.

Notwithstanding the independence and exclusiveness of the landed interest, we believe that agriculture is yet to be carried on extensively by joint-stock enterprise, like any other branch of production in which capital, machinery, and division of labour are requisite. Whilst we have old-school farming on the one hand, and amateur farming on the other, we think the very best results would be attained by the introduction of associated captial, assisted by the highest resources of science and art, and directed solely to commercial profit. Farming is not an obscure art: the sciences, too, of which it involves the knowledge, are already popular. In the United States—the inhabitants of which country believe it to be the natural granary of the world—large sums of capital have been withdrawn from trade, and especially from manufactures, and invested in extensive agricultural undertakings. In 1855, when the Crimean war was raging, and when the average price of wheat in England was 81s. per quarter, a large amount of American capital was diverted from its accustomed channels into extensive prairie farming; and, although the stimulant of high prices was in a comparatively short time removed, the influence of this movement was altogether beneficial, both to the individuals engaged in it and to the country at large. In England, where capital is more abundant, where the risk is less, and where our agriculture awaits only energetic and organised management, there is even now as great an inducement to the undertakings of which we speak. No one can estimate the changes to which such a course would lead. More than one million horse-power of steam engines, and more than ten millions in value of improved agricultural machinery might then, as we believe, be profitably employed. Our agricultural engineers, who have already associated themselves together for the sale of their machinery, might, we have no doubt, advantageously go a step further, and effect the organisation of an agricultural company, "limited," to become, as we believe it would, the parent of innumerable profitable undertakings of the same character.—The Engineer.

BREEDING AS AN ART.

The true value of pedigree in breeding has always been a vexed question among breeders. Men, careful, observing, and skilful, have frequently come to very different conclusions on a question as interesting as it is important. Some affect to decry blood as a slight thing, insisting that form, motion, and just proportion should be the principal considerations in our selection of breeding animals.

Others rely so much on blood that they pay too little regard to form, movement, and symmetry, and can see nothing wrong in pure blood—it *must* be good, because it *should* be, from its noble ancestry.

To be at once a skilful and successful breeder, neither of these theories must be adopted. Experience clearly demonstrates that a race of animals which have been bred so long as to acquire a fixed type have a wonderful power of communicating these peculiarities to their progeny. The same general form, the same colour, and the same expression of feature are transmitted with remarkable fidelity. When there is only a partial infusion of a particular strain of blood, it is often shown by appearing in some part of the cross, without any evidence of pure blood in any other part of the animal. Thus, a cross between the race-horse and a horse having only a small portion of his blood, in the common mare, frequently shows the soft, silky coat of the race-horse, with perhaps little else to show the cross. Cattle, far removed from the thorough-bred, will often show all the peculiar markings of the race, while in almost all other respects they are entirely unlike them.

But on the same principle by which blood communicates its valuable qualities, it carries along with it its defects. Hence, before selecting an animal, however pure in blood, we must carefully examine its form, and see if it has all the requirements of its race in a high degree; and we must, at the same time, consider whether it is free in whole or in part from the defects of its family. If this be so, then we must see whether its qualities are superior or fully equal to the best of the race.

If we find an animal with the best pedigree deficient in form or movement, or valuable qualities, it must be rejected at once. For to attain the best results we must breed from the best blood, and from the product we must again select with the same consummate art those for the improvement of the stock which have the most valuable qualities and the fewest defects.

In breeding the horse, power and endurance are the leading considerations. But, then, symmetry and grace are elements of so much value to the eye of an amateur, that a powerful animal, rough and uncouth in form, and destitute of grace in his movements, will not usually meet with a ready sale or bring a very high price. The breeder's constant aim in breeding these animals must be to combine powerful action with symmetry, grace, and beauty.

The farmer who breeds cattle must, or should have, a definite object in his mind. If his farm is rough, with short feed, the Durham or Hereford will not be likely to thrive so well as some of our native varieties, or the hardy and beautiful Devon. Many of the red cattle of New England are very fine, and I should much like to see them taken up by a skilful breeder. Their colour does not equal the Devon, being several shades lighter. Their heads are often coarse and large, and their hair is long and coarse. But they are strong, free-goers, hearty feeders, patient under the yoke, and hardy to endure the bitter winter storms of New England. This is a subject to which I wish particularly to direct the attention of breeders at the north. Suppose you wish to raise a cow for the dairy, we have some noble specimens of dairy cows, inured to our climate, and deep milkers. Whoever will select animals for this purpose, choosing with care and judgment, will be sure to succeed. A fortune would soon be realized to any one who can establish a breed of superior milkers. They would attract immediate attention and bring remunerative prices.

Have we not as good, nay, *better* milkers than any we can import? Very little attention has been paid to the improving our native breeds of cattle for this purpose. Thus far I have seen no cattle that, for working oxen, excel the native breed of New England.

The question of the true value of pedigree is embarrassed with another of equal quality. In following pedigree the breeder finds it convenient to breed in-and in, or, in other words, to breed together, two animals nearly related; and the question is, how far experience warrants in this breeding? It seems to be everywhere conceded that man must not connect with near relations. This is considered to be fully settled by experience, and the instincts of our nature. seem to admonish us of this great law. But because this is the law of man's nature, it by no means follows that it is a law of animal life, as some have rashly concluded. With regard to most animals we find no instinct forbidding the intercourse of near relatives, and to a considerable extent it seems a matter of chance. In the case of many insects, breeding in-and-in is the law of their existence. The female honey-bee has no connection with the males of strange swarms, but her intercourse is with the males of her own hive. Many insects fertilize themselves.

Some experienced breeders of cattle and horses think that breeding "in" and then "out," is meant breeding an animal into the same family from which it sprung and then into a family of the same breed several degrees of relationship removed from it. The English race-horse you may breed to pure blood, and yet the two animals may be only very distant relations. But if you are desirous of establishing a new breed or variety, you must to some extent breed "in-and-in," in order to perpetuate the qualities prized in the original, and to give the stock bred that fixedness of type and uniformity which is of great importance. But this alone is not sufficient. Care must be taken to select animals that bear the closest resemblance to the original, including form, size, colour, movement, expression of countenance, and temper.

There will be found to be a very great and striking difference in the power of animals of the same blood in transmitting to their offspring their own peculiarities. This power will exist in a much higher degree in the offspring strongly resembling the original than in those possessing less resemblance. But it must not be forgotten it is impossible to determine with absolute certainty what the character of an offspring will be, simply by a careful consideration of its pedigree, or comparison of its form and temperament with the original type. Attention to these will enable the breeder to form an opinion of the character of the stock the animal will be likely to produce; and this opinion, if the result of a well-informed judgment, will prove, in many important respects, correct. Farther than this we cannot go. In selecting animals for breeding purposes, great care should be taken that we do not allow ourselves to be enticed into the choice of an inferior animal by a long and brilliant pedigree. However important, and however much we may desire it, we should never allow purity of blood to blind us to defects in form or substance.—"L.," in *American Stock Journal.*

TO PREVENT MILK AND BUTTER TASTING OF TURNIPS.—Cut off the crowns and roots; don't allow the cows to have their turnips till they have been milked, and never give a bruised or decayed one. Use a little saltpetre in the warm milk: this prevents the taste most effectually.

CALENDAR OF AGRICULTURE.

Sow spring wheats on turnip lands cleared of the roots; and on dry warm lands sow early peas, rye, and beans. Sow barley or bere, and spring vetches, on leys and stubbles, and the seeds of cabbages on well-prepared beds or border grounds, to raise plants for the fields in May or June. Plough leys and stubbles during fresh weather; and during frosts carry dung, earths, stones, and fuels, as may be required; carry stones to drains and to roads.

Continue the feeding of live stock as directed last month. Oilcake will now begin to be used; it much hastens fattening, and greatly improves the quality of the dung. Break or bruise the cake, and place it in troughs. Oats and salt are beneficially used with it.

Remove all turnips from the fields without delay.

Flood watered meadows, and lay dung on grass-lands during fine weather; bush-harrow and roll the surface during dry weather, and pick off by hand any stones or rubbish that would impede the scythe. Repair fences and gates, spread mole-hills, and all tufts of dung on grass-lands.

Dig hop-grounds, open the hills, and apply strong manures, as the best rotten farm-yard dung, rags, composts of lime and earths, and salt; all oleaginous substances answer well. Dress the roots, and cut off the shoots for sets.

Continue the thrashing of grains, as the straw is required, and sell and deliver the corns; follow without intermission draining and subsoil ploughing.

Plant all kinds of useful forest trees, as oak, ash, elms, and birch. Set osiers in beds and in rows on low damp grounds; lay the beds dry by means of open dividing ditches, and dig the grounds one year before planting. Cut underwoods and fell timber trees during the whole month, and plash and repair old hedges, and plant new ones in moist weather.

Never cease to collect manures of every kind, and in all shapes and forms. Earthy substances mixed with decaying vegetables will never in any case disappoint the farmer; a compost heap for the reception of all such articles is a most indispensable requisite on every farm, be it large or small in extent.

CALENDAR OF GARDENING.

Dung and leaves, or leaves only, are excellent manure for raising early asparagus and potatoes. Withered grass is mixed with the leaves, and forms a valuable dung for early crops. The weather, although often very cold and showery, with snow, hail, and sleet, becomes milder, and allows the operations of spade and fork during many fine intervals. Peas, beans, carrots, parnsnips, onions, and beetroot, may be sown in grounds prepared during autumn in the effectual manner before described.

Asparagus plots are placed on grounds dug three feet deep, and dry by draining. The beds three yards wide, in four double rows, and the rows of plants are a foot apart, and an alley between them and at each end; the entire space is 18 feet, the length of the beds being arbitrary. A good natural ground needs not any mending; an inferior underground must be mixed with turfy loam and farm-yard dung, which raise the beds in height, and left to settle till Lady-day.

A similar preparation provides for seakale, artichokes, and rhubarb, which all remain fruitful for several years.

Sow twice, or oftener, spring spinach, lettuce, salads, radish; and at the end of the month sow carrots, onions, leeks, and some early cabbages.

Of parsley sow a full crop as edgings or in beds: sow annually, though the plant lasts for two years. Sow fancy plants, as salsafy, borage, burnet, angelica, and chervil; and sow most herbs late in the month, as thyme, hyssop, marjoram, and savory.

Prepare good soil for garlic and shallots.

Prune gooseberries and currants, retaining the best young wood, and pruning well to produce large clusters of fruit. Retain about six canes to a raspberry-bush, and collect them neatly into a top. Lay dung on the surface of the ground without digging, and remove any wandering suckers.

Prune well fruit trees, and finish with pears and apple espaliers.

Strawberries: Plant beds and borders on deep new ground, as Keen's early kind, Queens as mediums, and Eltons for the latest supply.

Flowers: Sow annuals on rich light soils, with leaf-mould and rotten cow-dung; the hardier roots, as convolvulus, lupins, sweet-pea, Venus' looking-glass, dwarf lichens, and candytuft.

In fine dry weather in the end of the month, spread over the beds a thin dressing of fresh virgin earth, rotten cow-dung, or leaf-soil. More effectually renew the beds a foot deep with good fresh earth every year. Nothing equals fresh soil for such purposes.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR JANUARY.

In the month just concluded large quantities of rain have fallen in nearly all parts of England, and the excess in the supply of moisture has, to some extent, interfered with outdoor labours. With the exception, however, of the pastures being heavy and partially flooded, there is nothing seriously to complain of. Notwithstanding the large consumption going on, the moderate nature of our importations from abroad, and the comparative deficiency in the produce of last year's crop, the wheat trade has continued in a state of great inactivity, prices have ruled very low, and millers, generally, have shown no disposition to purchase beyond actual wants. Whilst freely admitting that the yield of the new wheat is deficient, that most of the samples are somewhat inferior in a comparative sense, and that the potato crop is not free from disease, we cannot lose sight of the all-important fact that there is no want of an adequate supply of food in the country. Our farmers still hold some quantity of wheat produced in 1858, and we have what may be considered full average supplies of foreign produce in warehouse. The annexed figures show the stocks in London at the commencement of the month, when compared with the corresponding period in 1859:

STOCKS OF FOREIGN PRODUCE IN LONDON.

	1860.		1859.
Wheat............qrs.	308,162	...	230,000
Barley.............. „	19,726	...	60,000
Oats.................. „	238,507	...	320,000
Rye.................... „	1,199	...	11,000
Maize .... „	5,508	...	23,000
Beans .... „	4,152	...	16,000
Peas .... „	2,732	...	7,400
Flour .... sacks	23,394	...	12,000
Do................ brls.	19,821	...	21,000

Thus it will be seen that the supplies on hand are seasonably large; and we may observe that most of the wheat is in fair condition, especially that lately received from the south of Russia. As regards the probable future range in the value of wheat, we may observe that present quotations are safe; but against any important rise in the quotations we must place a higher range in the value of discount accommodation, and the possibility of some important change in the laws in France regulating the import and export duties on produce. The period for any change may be delayed; but we must bear in mind that the Emperor has declared himself in favour of free-trade principles, and that, in the event of the supply of grain on hand in France being more than equal to the necessities of the country, the change here referred to may be carried out at a time when very few persons in this country will be prepared for it. Dear money, then, may, and no doubt will, tend to check speculation, the present low rates notwithstanding; besides, any upward movement of importance in the value of wheat here would be speedily followed by increased shipments from the United States.

On the whole, the barley trade has continued in a healthy state; and, with the exception of inferior malting parcels having changed hands at a slight reduction, prices have been well supported. A great scarcity of really fine barley is still complained of; but the deficiency has, in some measure, been made good by steady—perhaps we may say large—arrivals of useful qualities from Scotland. Other kinds of spring corn have ruled tolerably firm, and no change has taken place in the value of flour.

From most of the leading grazing districts, rather favourable advices have come to hand respecting the health of the stock. No serious losses from disease have been complained of; but we may observe, that rather large numbers of sheep have become lame from, possibly, the effects of the prevailing damp weather.

The wool trade has continued in a healthy state, arising from the great activity in the manufacturing districts. The public sales held at Liverpool have gone off steadily, and the next auctions of foreign and colonial, to be held in London next month, are looked forward to with considerable interest, especially as our manufacturers now hold a much smaller quantity of wool than has been ever known at this period of the year.

New hops still continue to creep up in price, owing to the continuance of speculative operations. We have every reason to believe, however, that the consumption of beer in the metropolis and elsewhere has not increased; hence, the bulk of last year's enormous crop is still on hand. Any attempt, therefore, to force sales must result in a considerable decline in value.

Full average supplies of both hay and straw have been on offer. The trade, generally, has continued steady, as follows:—Meadow hay, £2 12s. to £4 4s.; clover do., £3 10s. to £5 5s.; straw, £1 5s. to £1 10s. per load.

Letters from Ireland and Scotland state that no changes of importance have taken place in the value of any kind of produce, that dealers have continued to operate cautiously, and that the stocks of produce on hand are seasonably good. From Ireland, only limited shipments have been made to England; but from Scotland, they have been somewhat extensive.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

For the time of year full average supplies of beasts, in excellent condition, have been on offer in the various markets of consumption held throughout the country. For most breeds there has been a steady, though not to say very active, demand, at mostly full quotations. The Norfolk season has commenced under most favourable auspices, as respects the general weight, quality, and condition of the stock. As yet very few even middling beasts have arrived in London from that county, and most of our advices agree in stating that the number on the land and in process of stall-feeding is somewhat in excess of the corresponding period in 1859. This is an important fact for consumers; still it is in no way clear to us that we shall have prices lower than at present, even though the dead markets may continue to compete with those for live cattle. The stock at hand from Scotland has turned out remarkably fine; since not only has it weighed well, but it has carried a large quantity of internal fat. And here we may remark that the crosses—which now form fully two-thirds of the supplies from north the Tweed—are showing some wonderfully fine points; indeed, we may state that in many respects they are superior to the original Scots, and that they now command the highest price in the metropolitan market. This excellence in quality fully justifies the remarks we have from time to time offered on this important question, viz., the extension of crosses between shorthorned bulls and Scotch cows. So long as the system is not carried too far—in other words, so long as the breeders confine their attention to two *pure* and distinct breeds—great success will be the result of the new system; but it may eventually be carried on with inferior stock, and break down at a period when increased profits are looked forward to.

Only moderate supplies of sheep have been on offer, and the demand for them has continued in a healthy state, at full quotations, the best old Downs and half-breds having realized 5s. 6d. per 8lbs. The scarcity of these particular breeds has been much complained of; even present high currencies have failed to increase the supplies, and the impression is that the actual numbers in the country are comparatively small.

Calves and pigs have sold at high quotations, and the demand for them has continued in a healthy state.

Judging from the present activity in trade and commerce, the prospect of a large and profitable trade during the greater portion of the year, and the enormous consumption of the better kinds of food, we may safely assume that fat stock will rule high in price for several months; indeed, there is no one feature which seems to indicate anything like inactivity in the demand. We may have increased importations from the Continent, and those of an improved character; but the additional wants of the country are clearly not adequately met by our own graziers and feeders. Since we last wrote the importations into London from abroad have been as under :

	HEAD.
Beasts	1,543
Sheep	4,309
Calves	908
Total ..	6,760
Total in 1859	9,264
„ 1858	2,342
„ 1857	4,633
„ 1856	3,292
„ 1855	9,102
„ 1854	7,919
„ 1853	12,847

The total numbers of each kind f stock exhibited and sold in the Metropolitan Cattle Market, last month, were:

	HEAD.
Beasts..	20,500
Cows	535
Sheep	92,425
Calves..	1,078
Pigs	2,045

COMPARISON OF SUPPLIES.

Jan.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1859......	19,805	364	90,620	921	2,400
1858......	20,312	572	80,742	1,108	1,759
1857......	19,949	355	81,200	1,071	2,355
1856......	17,532	435	101,600	757	2,930
1855......	19,717	500	120,470	962	2,625
1854......	19,687	510	95,080	887	2,279
1833......	20,717	480	96,800	2,148	2,360

Beef has sold at from 3s. 4d. to 5s.; mutton, 3s. 8d. to 5s. 6d.; veal, 4s. 6d. to 5s. 8d.; and pork, 3s. 6d. to 4s. 10d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	Jan., 1856.			Jan., 1857.	
	s. d.	s. d.		s. d.	s. d.
Beef, from..........	2 10	to 4 10	...	3 4	to 5 2
Mutton	2 10	5 0	....	3 8	5 6
Veal	4 2	6 0	....	3 8	5 0
Pork	3 8	5 0	....	3 8	5 2
	Jan., 1858.			Jan., 1859.	
	s. d.	s. d.		s. d.	s. d.
Beef, from..........	3 2	to 4 6	....	3 0	to 5 0
Mutton	3 4	5 4	....	3 2	5 2
Veal	4 0	5 4	....	3 4	5 2
Pork	3 6	4 10	....	3 2	4 2

The arrivals of beasts from Norfolk, Suffolk, Essex, and Cambridgeshire, have amounted to 8,000 Scots and crosses; from the northern counties, 4,000 shorthorns; from other parts of England, 5,000 of various breeds; from Scotland, 1,810 Scots and crosses; and from Ireland, 360 oxen and heifers.

Newgate and Leadenhall have been well supplied with both town and country-killed meat. Trade generally has ruled far from active, nevertheless prices have been supported.

ISLE OF ELY.

The new year has opened upon us without any decided improvement either in our circumstances or immediate prospects. The bad crop of wheat of last year, and the continued low prices, will be more and more felt as the season advances. The stack-yards are already getting very much thinned; and long ere another harvest is here supplies will be exhausted, and money will be scarce we fear. The prospect as regards the growing crop, we rejoice to say, is more cheering; and although there may be no relief before that crop is secured, yet we trust it will prove sufficiently plentiful and abundant, as in some measure, when ingathered, to restore us to a position of prosperity: although the heavy losses of this year can scarcely be expected to be recovered in any one season, however propitious. Since the intense frost of December, when the thermometer reached zero, the weather has not been very severe, but has been characterized by great variableness. Slight frosts, strong gales of wind, pelting storms of rain, and once or twice, for the season of the year, a high temperature, have in succession prevailed. The increased amount of rainfall has been one of the distinguishing peculiarities of the present winter, and it is one which, more than any other, inspires hope in the breast of the fen farmer. For two or three years we have suffered considerably—at least, we think so—for want of moisture, causing our dusty soils to become so thoroughly disintegrated and pulverized, that we have been unable to get them sufficiently compressed and consolidated; and to this circumstance we conceive our failure in the wheat crop last harvest was greatly attributable. Our fen lands have now had a good soaking; the rains have been frequent and tolerably copious, and the growing wheats are looking strong and healthy. The later sown, which a month ago we reported as not out of the ground, have now made their appearance, and present a vigorous and promising aspect; and we do not remember to have seen a case of failure in this immediate locality. The work upon the farm just now is not very interesting. The deep cultivation to which we referred in our last report has not ceased to invite attention. Our only further remark upon it this month is, that we are in this respect continuing to do with horses what might be more perfectly and economically effected by steam; and we trust the day is not far distant—and we believe it is not—when the steam-engine will be largely employed in the cultivation of our fen soils. We await the return of good crops and remunerative prices, that we may be enabled to meet the necessary outlay conveniently; and the adoption of the principle will not then be long deferred. Ploughing for oats, beans, peas, and other early spring crops is being proceeded with, and is hastening to completion. Horse-work on the farm is generally very forward, and, with suitable weather, some of our farmers will ere long begin to deposit the seed for their spring crops. The December frost completely destroyed the coleseeds, which were so seriously injured by the sudden and intense frosts of Oct. For the last month the sheep have lost, rather than gained, hand, and are being sent away to market in much worse condition than was intended. Some fields of coleseed have not been worth stocking at all, and have been ploughed in. The loss in sheep-food throughout this entire district has been enormous; and with a severe and backward spring, sheep-keeping will be very scarce indeed: and sheep themselves, *i. e.*, fat sheep, will be still more scarce. Mangolds are keeping quite as well as could be expected, and are becoming an invaluable root to us, and every year are increasingly cultivated. The frost has done them far less injury than our fears at the time led us to expect. The corn trade continues heavy and depressed. The weather has been extremely unfavourable for thrashing, and the condition of the grain is consequently seriously affected, which makes it sell badly. We cannot avoid the impression that some advance must yet take place in the price of wheat. The deficiency of crop in this country, combined with the fact that in the wheat-exporting countries the crop is not excessive, indicate to us the probability of a higher range of prices ere another harvest arrives. Meat continues to sell well, and even points to higher prices. Store sheep are high, and are increasing in value every week.—Jan. 17.

WEST GLOUCESTERSHIRE.

The continuation of severe winterly weather that we have experienced during the past month has impeded progress in field operations on the tenacious soils, of which this district is mostly composed. The intense frost we experienced before Christmas has been productive of considerable injury, and succeeded as it was by a great downfall of rain, the benefit the land would otherwise have derived has been materially negatived. Alternate frosts and rain since that period have not tended to amelioration. The frost, however, afforded favourable opportunities for manuring the grass lands, a process not in all cases completed, and subsequently the land has scarcely been in a fit state to bear the carts without injury. The effect that will be produced to the young wheat crops is a subject for special inquiry. In many instances the grain had very recently been consigned to the earth when the frost commenced, and subsequently the land has been in such a cold condition that not a vestige of vegetation is discernible above ground. Without any desire to produce alarm, this is a consideration demanding notice. Wheat, it is well known, will bear a vast amount of cold, after it has germinated and sent forth its blade; but whether the intense and deeply-searching frost of December will not be injurious in those instances where the grain had just sprouted in the earth, is a question which time alone must determine. Thrashing has not been prosecuted with much energy; there have not been many inducements. A range of low prices has lain dormant some time, and the weather, although oft-times frosty, has not been of that character to effect improvement in the condition of the grain. The imperative requirements of straw have been the chief inducements to thrash. The destruction the frost has made amongst the potato stores is distressingly extensive. Large quantities that were secured with sufficient care to withstand the severity of ordinary frosts are spoiled; and many a poor labourer's stock is totally annihilated. The severity of the weather presents a striking contrast to that of the preceding winters of 1858 and 1859, when the grass lands were comparatively in a growing state, so much so as to induce many, too many it must be admitted, to depend almost entirely on the cold winter grass as the principal food for their young stock. That, however, is not now the case, and hay, with roots, or some other food of that nature, is imperative. Stock is free from epidemic disorders at present; but what effect the severe atmospheric changes may produce among cattle unprovided with adequate warmth and shelter, which, unfortunately, in this district comprises a considerable portion, will be more clearly decided as the spring advances. Those which are exposed to hard fare and the chilling effects of the elements, already exhibit unmistakable signs of impoverished condition. Dairy work is in a state of quietude at this season of the year, affording farmers' wives and daughters an acceptable respite from their labours, and enabling them to enjoy the festivities of Christmas without interruption.—*Jan.* 19.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BANBURY FAIR.—Nag horses ranged from £35 to, in one instance, as high as £130, and good cart horses from £40 to £90. There were, of course, horses of an inferior description at lower prices, but the sums just quoted prove that for really good horseflesh there was a more than commonly brisk demand. The principal sales took place on Wednesday, though a fair amount of business was transacted on the other days. The supply of beef and mutton was very good, and prices were well maintained, though the trade was not quite so brisk as was expected.

DUMFRIES PORK MARKET.—The number of carcases was 490; and the market was favoured by a keen frost, which materially assisted the sale, though an advance was demanded and obtained of 1d. to 2d. per stone on last week's prices. Buyers were very numerous, and all the carcasses were quickly bought up. Current rates for prime porkers 6s. to 6s. 8d. per stone, and in some instances even 6s. 9d. was reached; secondary quality 6s. 3d. to 6s. 5d., heavy weights 5s. 8d. and upwards. Corresponding market last year, 1,120 carcasses; top figure, 5s. 8d. to 5s. 11d.

KELSO FORTNIGHTLY MARKET.—There was a large supply of cattle, and a small show of sheep. The quality of cattle shown was inferior to what we have had shown this year, there being only one or two prime fat lots in the market. The demand was good, and all were early cleared off at prices from 7s 6d. to 8s. per stone, being considerably better than last market. The supply of sheep was small, which were sold at prices from 7½d. to 8d. per lb.

KNARESBRO' FAIR.—There was a good show of fat stock, at from 7s. to 7s. 9d. per stone. An average supply of lean cattle, and prices had a downward tendency. No change in the price of calving cows.

LINCOLN FORTNIGHTLY MARKET.—There was a much larger show of both beasts and sheep than we have seen for many weeks past, and the general quality was very superior. There was a large influx of buyers from Nottingham, Derby, Leicester, and other midland towns, and they exhibiting an anxiety to purchase, the trade was extremely brisk, everything worth notice realizing good prices. Well fatted young oxen and heifers readily fetched 7s. 9d. to 8s. per stone. The quotations for middling qualities were 7s. 6d.; inferior, 7s. per stone. The mutton trade, owing to the extensive supply, was scarcely so brisk, prices being—for ewes 6d. per lb., wethers 7d. to 7½d., for size and quality.

TEWKESBURY FAIR.—There was a moderate supply of sheep, most of which—about 80—were sold by auction at fully 8d. per lb. There was a fair supply of cows of middling quality, which fetched 6½d. to 6¾d. per lb. But very few pigs, the only fat one on offer selling for 11s. per score.

WARWICK MONTHLY FAIR was unusually well attended, considering the unusual state of the atmosphere, and first quality stock, of every description, realised the highest prices. The ruling rates were as follows: Beef 6½d. to 7½d., ewe mutton 6½d. to 7d., wether mutton 7½d. to 8d. per lb.

WELSHPOOL FAIR.—There was quite as good an attendance of buyers as at an ordinary fair. There was, also, a tolerably good show of cattle, which sold well. The prices were: Beef from 6½d. to 7d., mutton from 7d. to 7½d., bacon pigs (full) 6d. Cart pigs sold well, and there were but few horses.

WINSLOW MONTHLY MARKET.—There was a visible falling off in the market, of sheep and cow stock; of pigs, however, there was a good supply. Fat mutton realized 4s. 6d. to 5s., wether mutton 4s. 8d. to 5s. 3d. per stone, and store sheep from 30s to 42s. each. Bacon hogs from 9s. to 10s. per score. The cow stock consisted of about 30 head of down-calving cows, heifers, and stirks, the former fetching from £15 to £20 apiece, heifers £12 to £18, stirks £9 to £18 per pair, fat cows £18 to £23.

WORCESTER FAIR.—The attendance of buyers was large, and the show of stock very good, particularly in fat beef and mutton. All was sold. Beef made 7d.; mutton 7½d. to 8d. per lb., with a ready sale for all sorts. For good cows and calves there was much inquiry, and also for barrens. Pigs were on the advance, both fat and store. The former made 10s. to 10s. 6d. per score. In horses but little doing.

YORK FORTNIGHT MARKET.—Calving and dairy cows were in about equal supply and demand, at late prices. All kinds of grazing beasts were plentiful, at rates in favour of buyers. A good supply of fat beasts sold at 6s. 9d. to 7s. 3d. and 7s. 9d. per stone. Mutton sheep 6½d., 7d., 7½d., and 8d. per lb. Grazing sheep were numerous: hoggs 42s. per head.

IRISH FAIRS.—BALLINASLOE: The supply exhibited was much larger than was expected, but there was also a good attendance of buyers. Cattle in prime condition were bought up early, and there was an excellent demand for first-class animals. The supply of sheep was not large, and the prices asked were beyond the views of buyers. There was a good supply of agricultural horses, some of which changed hands at fair prices. The supply of pigs was not large, and the demand good at very high figures.—GRANARD: There was a large supply of pigs, which sold quickly at 50s. to 52s. per cwt. for bacon qualities; stores 45s. to 50s. Young cattle were neither plentiful nor good.—KELLS: Good beef sold quickly at 60s. per cwt., but inferior sorts were in bad demand. Nice strippers sold well. The sheep fair was small, and wedder mutton brought 6½d. to 7d. per lb. There was a large supply of pigs; bacon sorts brought 50s. to 60s.; stores 45s. to 50s. each. The horse fair was of no particular importance.—FINEA: The supply of horses was very abundant. Prices ranged from £8 10s. to £25. Bacon pigs 48s. to 52s. per cwt., slips and stores 35s. to 60s. each. Prices of all kinds of stock were better than at Granard.—DUNDALK: Beef rated from 45s. to 55s. and 60s. per cwt. Yearling beasts £3 to £4 10s. The supply of springers and strippers was moderate, both in numbers and quality. Mutton brought 6½d. to 7¼d. per lb. There was a large fair of swine, and the demand for finished pigs for the English market was brisk in the extreme, at prices up to 55s. per 120lbs.

CORK BUTTER EXCHANGE, (Saturday last.)—The supplies in our market are still limited, amounting to 2,000 firkins for the week, compared with 3,200 firkins this week twelve months. High as the price is, it has a decided tendency upwards, owing to the eager competition among buyers; thirds, fourths, and fifths have advanced 2s. each per cwt. during the week. This day's prices are from 70s. to 121s. There is but little butter held by butter merchants.

REVIEW OF THE CORN TRADE

DURING THE PAST MONTH.

The first month of the new year has been mild and damp, with a considerable fall of rain, and but little frost. The change of temperature has facilitated the growth of the young wheat, and made that appear above ground which had not previously sprouted; but some land destined for autumn planting has hitherto been unsown, and must now either have spring wheat or Lent corn. The frequent fluctuations in the weather have lifted many of the plants, and the birds have been unusually active in the way of mischief; so without a very propitious spring and summer, there is no great prospect of a heavy crop. But the samples newly-thrashed have suffered most, the condition being so wretched as to make them unsaleable, unless at very losing rates, while what has been dry has about maintained former value. Good old has, therefore, been invaluable to millers, as well as dry foreign; and but for a liberal use of both, a good sack of flour would have been difficult to procure. With the condition so against them, farmers have had no chance, nor does there now seem much hope till the March winds have set matters right in this respect.

To thrash freely under such circumstances seems a suicidal act, and only justifiable by stern necessity; and by the less bountiful supply of the markets lately, it would appear such is becoming the resolve. The more liberal deliveries since harvest up to this point have been shaped into a practical argument against the deficiency of the last crop. But growers who have former rents to pay, without realizing former prices, well understand how much more stock must be quitted to meet engagements; and as the season gets on, we may see the effects in diminished supplies and better markets. The programme of the French Emperor, which has been published so suddenly, shows a full intention to adopt the principle of free trade; but there are strong opposing interests in France to be conciliated or coerced, and it may be another year before the plan is fully acted on. As yet, the prospect has somewhat shaken speculative operations in Paris, sales for distant delivery having received a sudden check. But so far as this country is concerned, no great change is probable, as prices in France are about equal to what they are here. The cessation of frost in the Baltic has a more immediate effect, as, where any margin appears, shipments may recommence by steam or otherwise; and while the ports of the United Kingdom keep moderately supplied on generally good stocks, no immediate advance can be expected. From the United States it seems improbable much will come, as New York, though extremely sensitive to any rise in Europe, is slow in yielding to the influence of such dull accounts as have been lately received. The intense frost of last month has done much damage to the potatoes stored, as well as to other roots, and keep has become scarce.

The following quotations for wheat in foreign markets will show how little can be sent here with a prospect of profit. Fine wheat at Paris is worth about 47s. per qr.; first quality wheat at Louvain brought 52s. per qr., weighing 64lbs. per bushel; Polish high mixed, at Amsterdam, was quoted 56s. per qr.; red wheat, at Groningen, 62lbs. per bush., 46s. per qr.; good 62lbs. Mark wheat, at Hambro', brought 48s. per qr.; the best Rostock and Pomeranian, for spring shipment, being quoted the same; at Stettin, Pomeranian and Uckermark, 63lbs. per bushel, 45s. 9d. per qr.; the price at Cologne was 47s. per qr.; fine high-mixed wheat, at Danzig, was still worth 50s. per qr.; Berlin and Konigsberg quoted 48s.; at Petersburg, Russian wheat for June delivery was 41s. per qr.; Ghirka, at Odessa, had sold at 39s. per qr. At Galatz some large sales have been lately made, at 32s. 9d. to 33s. 6d. per qr. Naples, with good arrivals, had declined in wheat to 47s. Native wheat at Genoa being scarce, brought 54s. In Algiers stocks were small, and hard wheat was worth 47s. per qr. The Spanish markets were very irregular, according to supplies or the difficulty or facility of transit; white wheat at Santander was quoted 55s., soft wheat at Burgos and Valladolid 41s. to 42s., and soft at Lisbon 57s. per qr.

Spring wheat at Chicago 97 c. per bush., or 32s. 4d. per qr. of 480lbs. New York had lately experienced some speculative inquiry. Milwaukie Club and red State had sold at 1 d. 25c. per bushel, equal to 41s. 8d. per 480lbs.; white Southern red 1 d. 45 c. per bushel, equal to 48s. 4d. per 480lbs.; prime white Kentucky at 1 d. 55c., equal to 51s. 8d. per qr. of 480lbs., or, at 63lbs. per bushel, to 54s. 3d. per qr.

The first Monday in London commenced on a small supply of foreign, and a moderate one of English Wheat. But few samples were showing from Kent and Essex, and these were mostly much out of condition. Those that were dry, or in comparatively good order, went off at fully the previous quotations; but most were below millers' wants, and remained unsold. The market being still of a holiday character, there was very little passing in foreign, and that at former rates. The country markets exactly corresponded with the London trade; the bulk exhibited was damp, and could only be sold accordingly; but all useful qualities commanded a somewhat better sale at the previous quotations; but Liverpool at the close of the week was 1d. per cental cheaper. Scotland generally was dull, both Edinburgh and Glasgow only being able to make sales somewhat in buyers' favour. The Irish markets were in calm.

The second Monday was rather better supplied than the first in foreign qualities. The morning's contribution from Kent and Essex was moderate, and as some dry weather had intervened, the condition was rather better; but there were still many rough parcels on show. The trade generally was rather improved—sales being more free, and picked parcels brought full prices, while the inferior were more easy to sell. The foreign trade, though still on a small scale, was firm. Some of the country markets, with improved qualities, sold at 1s. per qr. more money, as Lynn and Spalding; while Leeds, Hull, Bristol, Gloucester, and several other markets were rather against buyers for good samples; but Liverpool throughout the week was quite depressed, noting a fall of 1d. to 2d. on French qualities on Tuesday, and exhibiting much anxiety to sell on the following Friday, with but few buyers.

The third Monday was again moderately supplied, and there were but few samples from the near counties. It having, however, been again mild and rainy, the fluctuations had an extraordinary effect on the samples, many of them being almost as damp as grains. All that was fit for milling sold at unchanged quotations; but as what was left was unsaleable without a free admixture of dry foreign, it sold slowly at irregular prices. Russian sorts and all good foreign therefore found a more ready placement, and had it not been for the high prices demanded, there would have been a fair stroke of business. In the country the same features of business prevailed, the increasing scarcity of dry parcels keeping up their value, and the rest being neglected. But Liverpool, not recovering from the depression of the previous week, on Tuesday quoted a further decline of 1d. to 2d. per cental; but the downward tendency ceased on the Friday following.

The fourth Monday had scarcely any addition of foreign wheat, and only an average supply of home growth. The weather having continued unfavourable, there was again a sad display of its influence on the samples. No quotable difference of value could be noted on the little fine that appeared; but many of the damp lots remained unsold. This day was fine; but the market was unusually thin, and very little demand was experienced, even for fine foreign qualities. The country reports were all dull, though without much alteration, the advices being very similar to the previous week. The present stock of foreign wheat in the kingdom is estimated at 1,214,000 qrs., of which 308,000 qrs. are supposed to be in London, and nearly 290,000 qrs. in Liverpool.

The imports into London for the four weeks in January were 29,386 qrs. British wheat, and 13,629 qrs. foreign; with 72,534 sacks country flour, 600 sacks 7,007 brls. of foreign, against 23,711 qrs. British, and 41,513 qrs. foreign in January 1859, with 77,550 sacks country and 7,977 sacks 5,213 brls. foreign flour.

The flour trade throughout the month has been dull, with slight fluctuations of 6d. to 1s. per sack in Norfolks, but leaving prices much as they began, viz., 30s. to 31s. per sk.; French to 36s. per sk., and American barrels of fair quality 25s. to 27s. per brl. In town prices also, no change has occurred, 43s. per sk. remaining the top-price.

Malting barley of all sorts, including Scotch and foreign, has held its price, but there has been quite a depression in the secondary and lower qualities every successive market, showing more or less reduction in the value, more especially in stained English and Black Sea qualities, which have gone down fully 2s. per qr. This seems to be traceable to the liberal arrivals of the first three weeks, and the lower rates for beans and peas; but as the rates are now below oats and other grain, we may expect some recovery. Very little English malting has come to market, or even foreign, and maltsters who buy in London have had to depend on the fine heavy samples received from Scotland, which have readily brought 44s. to 45s. per qr., and it is a question whether there will be enough of this for the season. The imports into London for the four weeks of January were 35,142 qrs. British, and 53,365 qrs. foreign, against 17,279 qrs. British and 65,746 qrs. foreign in January 1859. The stock of foreign in London is about 20,000 qrs.

The malt trade, notwithstanding the firmness in malting barley, has rather given way, even in the finest qualities, while all below them have been extremely difficult to place on rather lower terms.

The oat trade, on moderate supplies all through the month, has been extremely steady, and had it not been for the expectation that some of the Baltic ports would soon be in a condition to make shipments from the mildness of the season, would in all probability have been rather dearer, as some time has now transpired to reduce the stocks in granary. No change of value can be quoted since December. The imports into London for the four weeks in January were 15,968 qrs. English, 5,504 qrs. Scotch, 5,710 qrs. Irish, and 71,064 qrs. foreign, against 1,150 qrs. English, 11,489 qrs. Scotch, 15,790 qrs. Irish, and 80,691 qrs. foreign, in January, 1859. Stock now supposed to be in first hand in London about 235,000 qrs.

Beans have receded in value in new English quaties 2s. to 3s. per qr., and in old foreign 1s. to 2s., but the condition of the samples has mostly occasioned the decline, as dry old English have been only about 1s. per qr. lower. The imports for the four weeks in January into London were 4,931 qrs. English and 5,828 qrs. foreign, against 3,526 qrs. English and 20,073 qrs. foreign in 1859. Stock in London 4,000 qrs.

Hog peas have also cheapened during the month 1s. to 2s. per qr.; but white boilers being very low before, have not declined, though the mild weather has been much against the sale. The imports into London for the four weeks were 3,216 qrs. English and 720 qrs. foreign, against 1,343 qrs. English and 252 qrs. foreign in January 1859. Stock in London about 2,700 qrs.

Linseed, with good supplies for the first fortnight, gave way about 1s. per qr.; but on their falling off, the decline was recovered, and all through the month cakes have been a ready sale, the damage done by frost to the roots crops making them more in demand.

Canaryseed has all along been declining, and received a further depression by a liberal foreign arrival; so that prices have now sunk to about 50s. per qr. for fair qualities, and were it not for the over-growth, stimulated both here and in Holland by the late high prices, might be considered a fair speculation. Tares have come into more active demand, at rather better prices, small foreign readily bringing 44s. per qr., with more asking. and 64s. per qr. for large. In cloverseed there has also been a moderate trade at improving prices for red, more especially fine foreign, as the little English appearing is mostly inferior, and the crop appears short. White seed, from scarcity, has risen 2s. to 3s. per cwt., and seems likely to rule high through the season, if there should be much demand: as grazing has lately paid better than corn, this seems probable. Mustardseed has been steady, but dull. Hempseed and other seeds little altered.

CURRENCY PER IMPERIAL MEASURE.

Shillings per Quarter.

WHEAT, Essex and Kent, white, new 38 to 49 ....old 40 to 51
„ „ red new 37 46 ....old 39 48
Norfolk, Linc., and Yorks., red.................. 37 46
BARLEY, malting, new 30 to 36 .... Chevalier, new.. 38 44
Grinding .... 24 26 .... Distilling 27 29
MALT, Essex, Norfolk, and Suffolk... 49 to 57 .. fine 60 68
Kingston, Ware, and town made .. 49 57 .. „ 60 68
Brown .... 48 49 .. — —
RYE ....new — — .. 30 31
OATS, English, feed ... 20 to 25 ...... Potato 25 30
Scotch, feed......... 21 26 ...... Potato 25 30
Irish, feed, white .... 20 to 23 .. fine 24 28
Ditto, black .... 20 23 .. „ — 25
BEANS, Mazagan........ 32 to 37 .... Ticks........ 34 37
Harrow............... 34 42 .... Pigeon 45 48
PEAS, new, white, boilers 36 40 Maple 37 to 38 Grey 33 34
FLOUR, per sack of 280 lb., Town, Households 37s., fine 41 43
Country .... 30 to 31 ...... Households .. 32 36
Norfolk and Suffolk, ex-ship 29 30

FOREIGN GRAIN.

Shillings per Quarter.

WHEAT, Dantzic, mixed 50 to — high do. — to 52 extra — to 55
Konigsberg .... 49 51 „ — — — —
Rostock .... 51 — fine 54 old 54 — —
American, white .. 43 49 red.... 42 to 47 — —
Pomera., Meckbg., & Uckermrk, red 47 49 — —
Silesian, red ...... 42 47 white........ 46 50
Danish and Holstein 46 48
Russian, hard 44 to 46 .. French 40 to 47 .. white 44 48
St. Petersburg and Riga 42 47
Rhine and Belgium............................... 44 50
BARLEY, grinding............ 23 to 25 .. Distilling.. 27 29
OATS, Dutch, brew, & Polands 22 27 .. Feed 19 23
Danish and Swedish, feed .. 20 24 .. Stralsund. 20 25
Russian 18 22
BEANS, Friesland and Holstein 34 38
Konigsberg.............. 32 to 36 .. Egyptian 33 35
PEAS, feeding .... 35 36 .. fine boilers.. 37 38
INDIAN CORN, white ...... 31 34 .. yellow 30 32
FLOUR, per sack.... French 29 36 .. Spanish, none — -
American, per brl., sour.. 22 25 .. sweet 24 27

IMPERIAL AVERAGES.

For the last Six Weeks:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans. s.	d.	Peas. s.	d.
Dec. 10, 1859	43	11	35	10	21	5	32	10	41	1	39	1
Dec. 17, 1859	43	8	35	1	21	9	30	0	41	0	38	9
Dec. 24, 1859	43	6	34	9	21	1	28	10	39	11	37	6
Dec. 31, 1859	44	2	34	8	21	5	35	1	39	7	37	8
Jan. 7, 1860	44	2	34	5	21	5	35	5	38	10	38	3
Jan. 14, 1859	43	11	34	7	21	5	30	4	39	0	36	7
Aggregate average .	43	11	34	11	21	5	32	1	39	11	38	0
Same time last year	40	5	33.	2	21	10	31	3	40	6	43	3

PRICES OF SEEDS.

BRITISH SEEDS.

Mustardseed, per bush., new 10s. to 14s. brown 12s. to 16s.
Coriander, per cwt. .... 14s. 16s.
Canary, per qr.................................. 50s. 54s.
Trefoil, new..................................... 24s. 26s.
Tares, winter, new, per bushel .... 7s. to 7s. 6d.
Linseed, per qr., sowing —s. to 60s. crushing.. 54s. to 58s.
Linseed Cakes, per ton................ £9 10s. to £10 10s.
Rapeseed, per qr............................... 50s. to 54s.
Rape Cake, per ton .... £5 10s. to £6 0s.

HOP MARKET.

BOROUGH, Monday, Jan. 23.—Our market exhibits no change of importance, the demand being limited, and the currency remaining firm, as follows—

Mid and East Kents .... 84s., 112s., 147s.
Weald of Kents .... 65s., 76s., 84s.
Sussex .... 65s., 74s., 80s.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, Monday, Jan. 23.—During the past week the arrivals coastwise have been very light, owing to contrary winds, and the best samples made a little more money. The following are this day's quotations:—

York Regents	100s. to 135s.	per ton.
Lincolnshire ditto	90s. to 110s.	„
Dunbar ditto	105s. to 130s.	„
Kent and Essex	90s. to 100s.	„
Perth, Forfar, and Fifeshire ditto	90s. to 110s.	„
Do. Rocks	75s. to 85s.	„
Do. Reds	70s. to 80s.	„
French whites	70s. to 80s.	„
Belgian ditto	65s. to 75s.	„

BOROUGH AND SPITALFIELDS.

LONDON, Monday, Jan. 23. — Since Monday last fair average supplies of potatoes have come to hand coastwise and by land-carriage. On the whole the trade ruled firm, as follows:

York Regents	100s. to 160s.	per ton.
Ditto Flukes	140s. to 150s.	,
Kent and Essex	80s. to 120s.	„
Scotch	90s. to 130s.	„
Ditto Cups	70s. to 90s.	„
Dunbar Cups	90s. to 100s.	„
French	80s. to 90s.	„

PRICES OF BUTTER, CHEESE, HAMS, &c.

BUTTER, per cwt.—	s.	s.
Friesland	116 to	120
Kiel.....................	120	124
Dorset	118	120
Carlow..................	108	118
Waterford	108	118
Cork	108	120
Limerick	100	106
Sligo	104	116
Fresh, per doz. 13s. 0d. to 17s. 0d.		

CHEESE, per cwt.—	s.	s.
Cheshire..................	66 to	84
Cheddar	76	88
Double Gloucester........	60	72
HAMS—		
York........................	80	90
Westmoreland	—	—
Irish, new	80	—
BACON: Wiltshire, dried.	64	66
Irish, green	56	62

WOOL MARKETS.

ENGLISH WOOL MARKET.

LONDON, Monday, Jan. 23.—Since our last report there has been an improved demand for nearly all kinds of English Wool, at very full prices. Holders seem to anticipate higher rates, especially as the inquiry for export purposes has increased, and as the stocks in the hands of the manufacturers are very small.

Per sack of 240 lbs.		
Fleeces—Southdown Hogs............	£19 10 to	£20 0
Do. Half bred Hogs	19 10	20 0
Do. Kent	18 0	18 10
Do. Southdown Ewes & Wethers	17 10	18 0
Do. Leicester do.	16 10	17 10
Sorts—Clothing, picklock............	19 0	20 0
Do. Prime and picklock..........	18 0	19 0
Do. Choice.........................	17 0	18 0
Do. Super	15 0	16 0
Do. Combing—Wethermatching ..	20 0	21 0
Do. Picklock	17 0	18 0
Do. Common	16 0	16 10
Do. Hog matching	23 0	24 0
Do. Picklock matchig	17 10	18 10
Do. Super do......................	16 0	16 10

FOREIGN AND COLONIAL WOOL MARKET.

Per lb.		s. d.	s. d.
German, Saxon, and Prussian.	1st and 2nd Elect............	3 4 to	4 6
	Prima	2 4	3 0
	Secunda	2 0	2 4
	Tertia	1 8	1 10
Colonial:—Sydney—Lambs		1 10	2 1½
	Scoured do.	1 8	3 0
	Unwashed	1 1	1 3
	Locks and Pieces............	1 0	1 10½
	Slipe and Skin	1 6	1 6½
Port Philip—Lambs..........		1 [illegible]	2 3
	Scoured do.	1 8	2 11½
	Unwashed	0 11	2 5½
	Locks and Pieces............	1 5½	1 9½
S. Australian—Lambs		1 10	2 1
	Scoured do.	1 1½	2 4½
	Unwashed	0 10	1 3
	Locks and Pieces............	0 7	1 1
V. D. Land—Lambs		1 10½	2 3½
	Scoured do.	1 2	2 10½
	Unwashed	0 11½	1 5

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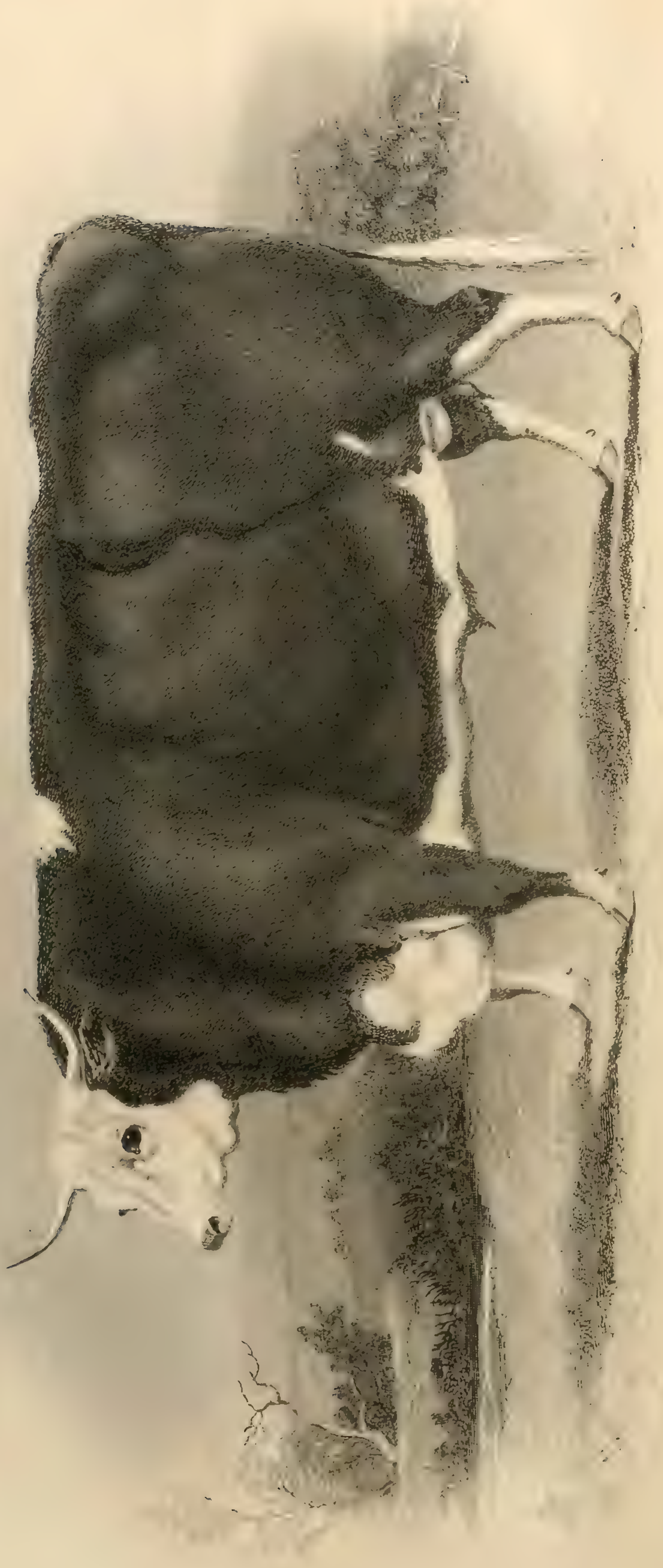

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THE FARMER'S MAGAZINE.

MARCH, 1860.

PLATE I.

BARON IPPOLYTE PETROFFSKI.

A CELEBRATED RUSSIAN HORSE-BUYER AND BREEDER.

In the thirty-six letter alphabet of Russia Baron Petroffski is known as "Ummoiuml Nemjsobevez." His residence is a short distance out of Moscow, on the right hand of the road in Petroffski Park, which received its name in honour of him. The house is a two-storied one, built in the Oriental style, entirely embedded in gardens, and with a large set of stables attached. These are, after all, merely his head-quarters during the season of thick-ribbed ice, and hardly furnish any index to the magnitude of his possessions, which consist of three large estates in the interior. On each of these he keeps nearly a thousand serfs; but his sway is not of a very iron kind, and those that are not engaged in agriculture are all taught some useful trade. He produces everything required for himself and this huge family on his own estates, from skeepskins down to his renowned kish-le-shee, a species of mead compounded from apple-juice, honey, and flour, and with an aromatic rose-water flavour.

Sixty-three summers have done very little towards blanching his hair or dimming his sharp hazel eyes, and he still carries his light wiry frame as erect as beseems a captain of the Imperial Guard. No one who has visited him can forget that gentle courteous bearing, or the enthusiasm with which he speaks of everything English, and of everything 'cute in connection with horse-management. Geese, sheep, pigs, and dogs (not forgetting the favourite black terrier which has been painted into one of his pictures), are all English; but we are not so sure as to the nativity of his fighting geese. They are stouter than the common geese, and on shorter legs, and are put down just like game-cocks on the green sod for the fray, which they solemnly conduct by seizing each other by the beak, and striking furiously with the butts of their wings.

The English Stud Book is his Koran, and he himself has been at the pains of publishing, in the Russian language, a most complete synopsis of the celebrated stallions in England from 1811. It enters with the greatest accuracy into the number of years they have been in the stud, the price at which they covered, and the dams of their most celebrated winners. Hence it was not surprising that, after such an exciting study, he should have determined that either Teddington or Rifleman should be a Russian Touchstone; and his son has just purchased the latter from Sir Tatton Sykes for 2,500 gs., for the Government.

"You like the horses of the old stock," he says, in writing to a friend, "and old form, just the same, which I prefer to the new-fashioned. I would like very much to try the best English horses with my poor fellows. I call my horses poor fellows because they are badly fed, and badly prepared. We have only two months to prepare horses, that is May and June. The horses are led 500 versts,* with all the road inconveniences. They change water and food, and suffer much."

The Baron breeds his horses at one of his estates, and they do their work in the winter, without shoes on frozen snow, regularly harrowed for the purpose. The ground is, however, mostly flat, without any extent or variety of gallops. The breeding farm is bordered by a noble river of great width, and in summer, when the flies teaze the young foals to distraction, they dash in and swim, while their dams watch them placidly from the bank, and occasionally join in the sport. Many of them have excellent hind-leg action, and their owner invariably attributes it to their early swimming habits. The brood mares alone number about 160, some of which are still unbroken, and most of them never trained. The blood is, strictly speaking, a cross between the Russian and Arab mares, and the horses imported by Government, Memnon, General Chassé, Van Tromp, Andover, &c.; and the stock are generally browns, of great length and on short legs, having all the Arab deficiency of shoulder, but catching the Eastern character in their fine eye and small nostrils, and bearing the Sir Hercules crest at the root of their tails.

The Baron also rather prides himself upon his breed of trotting horses; and he gave for Barkay, one of the best sires of that stamp, 11,000 roubles, without the least remorse. We believe that one of his best once trotted eight versts under the sixteen minutes; and they are also used for running in troskies on the ice.

A Surplice and an Irish Birdcatcher brood mare went out for him, along with Rifleman, who was to reach Moscow last month. In 1859, his stud consisted of seventeen horses in work, fifty brood mares, twenty-five two-year-olds, and nearly as many both of yearlings and foals; while Signal, Granite, and Bombadier are the principal sires. The Signals are his best stock.

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* Verst, $\frac{2}{3}$ of a mile.

PLATE II.

A HEREFORD STEER.

THE PROPERTY OF JOHN NAYLOR, ESQ., OF LEIGHTON HALL, WELSHPOOL, MONTGOMERYSHIRE.

This famous steer, bred by Mr. Naylor at Leighton Hall, was calved on October 8th, 1854. He was by Sylvester (797), out of Ellen, by The Knight (185), her dam Lady Elinor, by Big Ben (248), — Butterfly, by Prince (251), — Nell, by a son of Sir Andrew (183).

Silvester, bred by Mr. Price of Pembridge on the last day of the year 1851, was by Pembridge (721), dam by Prince Dangerous (362). Silvester was sold to Mr. Kincey, a neighbour of Mr. Naylor's, living at Glanmahely, Montgomeryshire.

Ellen was bred by Mr. Naylor on the 2nd of October, 1851, and this steer was of course her first calf. The Hereford Herd Book credits her with produce every year since.

At the Birmingham and Midland Counties' Fat Cattle Show in December, 1857, Mr. Naylor's steer took the first prize of 10 sovs. in the Younger Class of Herefords, with the silver medal for the breeder.

At the Smithfield Club Show the following week he took the third prize of 5 sovs. in the Steer Class of Herefords, a beast the property of Mr. Heath, and another of His Royal Highness the Prince Consort, being preferred to him.

At the Birmingham and Midland Counties' Show in December, 1858, he took the first prize of 10 sovs. as the best of all the Hereford Oxen or Steers, the extra prize of 20 sovs. as the best Hereford in the show, The President's Cup, value 25 sovs., as the best Ox or Steer bred and fed by an exhibitor, the Gold Medal as the best of all the Oxen or Steers, and the Silver Medal for the breeder.

Having already been exhibited at the Smithfield Club, he was not by the rules eligible to make another appearance in London, and his career consequently ended with this brilliant performance.

On his first coming to Birmingham in 1857 we spoke of this beast as "a wonderful animal for his age, of great width and weight." And, again, at the same show of the year following, we wrote—

"Taking the whole range of these three established breeds, a really good beast had every opportunity for distinguishing himself, as one most unquestionably did. This was Mr. Naylor's first prize Hereford ox, the best steer at this meeting last year, and that we then spoke of as promising to still further improve. He has now grown and fed into one of the *neatest* Herefords ever seen. His symmetry is so perfect, that, as is the case with all well-formed animals, he looks much smaller than he really is. Neither is he so "upstanding" as the sort often are, but more compact and close in his frame. With this he unites all the best points of his race—has a sweet head, is beautifully marked, and is as fine a handler as a butcher ever touched. Of course he carried off a whole accumulation of premiums. He had one as the best of his class, another as the best Hereford, a third as the best of all the oxen, a fourth as the best bred and fed by the same man, and a fifth as an especial compliment to his breeder. There wanted but the culminating honour as the best of all the animals, male or female; but with all their ingenuity in this way, the council have not yet arrived at that insignia. Mr. Naylor's ox cannot go on to Baker-street, having been exhibited there as a steer last Christmas, when he was hardly done justice to."

THE EARLY ENGLISH AGRICULTURAL AUTHORS.

[Second Series 1557 to 1626.]

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

I have in a former number of this magazine (see p. 7 of the present volume) given a few facts relating to the farming of England, about the year 1532, when the first works upon English husbandry — those of Groteherd and Fitzherbert — were printed. The next volume which appeared on husbandry — that of Tusser — was published in verse, in 1557. This poem, "The One Hundred Points of Good Husbandry," has been, from time to time, reprinted, and it is to be met with in most agricultural libraries.

Tusser's work was followed in 1594 by that of Sir Hugh Platte, "The Jewel House of Art and Nature"; and to this succeeded, about 1613, the several works of Gervase Markham on rural affairs. They all seem to have collected together a variety of useful facts—receipts and historical notices; but they suggested little for the improvement of agriculture, nor did they pretend to any inventions for its benefit. It was not until the time of Walter Blithe, in 1626, that any man appeared who had the sagacity to perceive how the produce of the earth might be considerably increased by new processes—who had the courage to set the example on his own farm, and had the fully equal hardihood to publish the results of his experiments.

Of Thomas Tusser, the well-known author of the "One Hundred Points of Good Husbandry," as I have said in another place, all that is known of him and of his curious production has been collected by Dr. Mavor, in his edition of Tusser's book, and by my brother, Mr. George W. Johnson, in his "History of English Gardening"; and both these authors have been obliged to content themselves chiefly with Tusser's own account of himself; for Tusser did what few men attempt—he wrote his own life, and in a manner still more rare, in verse. His life was full of adventure; for he evidently had all the restlessness of genius, with the unsettled habits too commonly confirmed by continued change of occupation.

He was born about the year 1515, at Rivenhall, a village on the high road between the towns of Witham and Kelvedon, in Essex, of a family allied by marriage to the higher ranks of society. He says of himself:

"It came to pass that born I was
Of lineage good, of gentle blood,
In Essex layer, in village fair,
That Rivenhall hight;
Which village ly'd by Banktree side:
There spend did I mine infancy;
There then my name, in honest fame,
Remain'd in sight."

He was, considerably against his inclination, educated for, and became, a chorister at the collegiate chapel of Wallingford, in Berkshire. His voice, it seems, was excellent; and, in consequence, he was pressed, as the despotic custom then permitted, for the choir of St. Paul's Cathedral. He speaks feelingly of a chorister's miseries:

"O painfull time, for every crime!
What touzed ears, like baited bears!
What bobbed lips, what jerks, what nips!
What hellish toys!
What robes how bare, what college fare!
What bread how stale, what penny ale!
Then Wallingford, how wert thou abhorr'd
Of seely boys!"

From London he was sent to Eton, and became a student there about 1534, under Udall, whose severity of discipline he has recorded. He then proceeded to Trinity Hall, Cambridge; but leaving it on account of ill health, he was dissuaded from returning by William Lord Paget, who kept him about the court as one of his retainers (most likely as a chorister), for ten years: he left that nobleman, however, without any improvement of his fortune. Retiring to Katwade (Catiwade), in Suffolk, he took a farm, and it was here that he composed his book on husbandry. He says of himself:

"When court 'gan frown, and strife in town,
And lords and knights saw heavy sights;
Then took I wife, and led my life
In Suffolk soil.
There was I fain, myself to train,—
To learn too long, the farmer's song,
For hope of pelf, like worldly elf,
To moil and toil!"

The ill state of his wife's health induced him, fter some years, to quit his farm, and reside at Ipswich, where she died. He was then married a second time, to Miss Amy Moon, and settled at West Dereham, in Norfolk—

"A place for wood, that trimly stood;
With flesh and fish as heart could wish."

But the temper of his youthful wife, and the harshness of his landlord, induced him to move to Norwich, where, under the patronage of Dean Salisbury, he appears once more to have become a chorister. He thus alludes to his second marriage, and its expenses:

"For lo! for guile, what haps the wile,
Through Venus toys, in hopes of joys,
I chanced soon to find a Moon,
Of cheerful hue.

* * * *

Behold of truth, with wife in youth,
For joy at large, what daily charge,
Through children's hap; what opened gap,
To more begun:
The child at nurse, to rob the purse,
The same to wed, to trouble head;
For pleasure rare, such endless care,
Hath husband won."

Ill health induced him again to remove; and he then took the glebe land of Fairstead, in Essex, near his native village. Fearing the death of the clergyman, he moved to London; but hastened thence, in 1574, to Trinity College, Cambridge, that he might be beyond the influence of the plague. The time he spent at Fairstead was evidently far from agreeable to Tusser, for he says:

"From thence so sent, away I went,
With sickness worn, as one forlorn,
To house my head at Fairstead,
Where whiles I dwelt.
The tithing life, the tithing strife,
Through tithing ill of Jack and Gill,
The daily pays, the miry ways,
Too long I felt.

"When charges grew, still new and new,
And that I spy'd, if parson dy'd,
(All hope in vain) to hope for gain,
I might go dance;
Once rid my hand of parsonage land,
Thence, by-and-bye, away went I,
To London straight, to hope and wait,
For better chance."

He returned to the metropolis, and died there, about 1580, certainly before 1585, as is proved by the title-page of the edition of his work published that year. That he possessed religious and moral feelings of the most excellent kind peeps out in many parts of his works. He thus concludes, for instance, the sketch of his own life:

"Friend, all things weigh'd, that here is said,
And being got, that pays the shot.
Methinks of right, have leave I might,
(Death drawing near)
To seek some ways, my God to praise,
And mercy crave, in time to have,
And for the rest, what He thinks best,
To suffer here."

He was buried in the church of St. Mildred, in the Poultry, according to Stowe, with this epitaph:

"Here Thomas Tusser, clad in earth, doth lie,
That sometime made the Points of Husbandry:
By him then learn thou may'st; here learn we must,
When all is done, we sleep, and turn to dust:
And yet through Christ to heaven we hope to go;
Who reads his books, shall find his faith was so."

This is an outline of all that is known of this extraordinary man. In whatever capacity he at various times lived he acted with ability, yet never so as to benefit his fortune. That he excelled as a singer is certain; for none but those of more than ordinary powers are admitted into the royal choir. As a courtier he was unfrowned upon till the disgrace of his patron. As a farmer it is evident that he possessed a correct knowledge, from his work upon the subject. The same book testifies that, as an author and a poet, he was far above mediocrity. Fuller, in his "Worthies of Essex," describes him, in his usual quaint manner, as "a musician, schoolmaster, serving-man, husbandman, grazier, poet, more skilful in all than thriving in any vocation. He spread," he adds, "his bread with all sorts of butter, yet none would stick thereon." The testimony of Fuller to the excellent private character of Tusser is valuable as coming from one who must have been the contemporary of many persons who well remembered our author. "I hear," says Fuller, "no man to charge him with any vicious extravagancy or visible carelessness." The true reason of his ill success in life is to be found, perhaps, in the verses of a poet almost his contemporary. Peacham, in his "Minerva," a book of emblems, published in 1612, has a device of a whetstone and a scythe, with this beneath:

"They tell me, Tusser, when thou wert alive,
And had'st for profit turned every stone,
Where'er thou camest thou couldst never thrive,
Though hereto blest couldst counsel every one;
As it may in thy "Husbandry" appear,
Wherein afresh thou liv'st among us here.
So, like thyself, a number more are wont
To sharpen others with advice of wit,
When they themselves are like the whetstone blunt."

Tusser's work first appeared in 1557, entitled, "A Hundreth Good Pointes of Husbandrie":

"A hundreth good points of husbandry
Maintaineth good household, with huswifry.
Housekeeping and husbandry, if it be good,
Must love one another like cousinnes in blood.
The wife, too, must husband as well as the man,
Or farewell thy husbandry do what thou can."

Imprinted at London, in Flete strete, within Temple barre, at the sygne of the Hand and Starre, by Richard Totell, the third day of February, an. 1557. Cum privilegio ad imprimendum solum."

A copy of this edition, which Dr. Mavor considers to be unique, is in the British Museum. It consists of only thirteen quarto leaves. The "Book of Huswifry," it is supposed, was at first printed by itself; it was afterwards added to the editions of the "Husbandry."

Tusser dedicated his book first to Lord William Paget, in an acrostic; and after his death to "the Lord Paget of Beaudesert," his son and heir. From this we find that Tusser shared an author's very common fate, for he tells us:

"By practice and ill speeding,
These lessons had their breeding,
And not by hearsay or reading,
As some abroad have blown;
Who will not thus believe me,
So much the more they grieve me,
Because they grudge to give me,
What is of right mine own."

Its price, when first published, as described in his prefatory address to the reader, was only 4*d.* or 8*d.* He says:

"What is a groat
Or twain to note,
Once in the life,
For man or wife?"

The style in which Tusser wrote his book is plain, and sometimes rather hobbling; but, at the same time, it is metre easily remembered; and verse is well adapted to impress upon the memory the mass of useful truths and rural directions contained in the work. In the rhyming preface, "to the buyer of this book" (for Tusser seemed to do every thing in verse), he says:

"What look ye, I pray you shew what?
Terms pointed with rhetorick fine?
Good husbandry seeketh not that,
Nor is't any meaning of mine."

His tenth chapter consists of a series of sixty-three excellent "Good Husbandry Lessons, worthy te be followed of such as will thrive." He omitted no opportunity to give occasion for seasonable reflections:

"As bud, by appearing, betok'neth the spring,
And leaf, by her falling, the contrary thing;
So youth bids us labour to get as we can,
For age is a burden to labouring man."

He commends the system of moderate corn rents, and was evidently no enemy to the sports of the field:

"To hunters and hawkers take heed what ye say,
Mild answer, with courtesy, drives them away;
So where a man's better will open a gap,
Resist not with rudeness, for fear of mishap."

He begins his monthly husbandry with September, for that was then the period, as now, when arable land was commonly entered upon by the farmer. He says, in his opening stanza:

"At Michaelmas lightly, new farmer comes in,
New husbandry forceth him; new to begin;
Old farmer, still taking the time to him given,
Makes August to last until Michaelmas even."

In furtherance of his object, that of giving some very minute directions to the in-coming tenant, he even gives a catalogue of farming implements in verse, in which he manages with some adroitness to include several apparently impracticable names, such as—

"A hand-barrow, wheel-barrow, shovel, and spade,
A curry-comb, mane-comb, and whip for a jade."

It was the approved practice in Tusser's days to "sow timely thy white wheat, sow rye in the dust." They were used also to put rye-meal into their wheat-flour:

"But sow it not mixed to grow so on land,
Lest rye tarry wheat till it shed as it stand."

Thick and thin sowing had even then their respective advocates:

"Though beans be in sowing but scattered in,
Yet wheat, rye, and peason, I love not too thin:
Sow barley and dredge with a plentiful hand,
Lest weed, stead of seed, overgroweth thy land."

It is evident that in those days the farmers were not able to grow their corn on many soils where the modern holders find no obstacles. Thus he speaks of the difficulty they found in producing barley in the parish of Brantham, in Essex, where he farmed some land; and, again, he tells us, what will surprise the modern skilful Suffolk farmers—

"In Suffolk, again, whereas wheat never grew,
Good husbandry used, good wheat land I knew."

And he adds:

"As gravel and sand is for rye and not wheat."

He mentions several varieties of wheat then grown by the farmers of the reign of good Queen Bess, such as white and red rivet, white and red pollard, Turkey and grey. But of this last he says:

"Oats, rye, or else barley, and wheat that is grey,
Brings land out of comfort, and soon to decay."

The land, however, was evidently farmed with little skill:

"Two crops of a fallow enricheth the plough,
Though t'one be of pease, it is land good enow:
One crop and a fallow some soil will abide,
Where, if ye go further, lay profit aside."

His directions to the farmer with regard to the treatment of his harvestmen and the poor gleaners, and his warm hopes for the farmer's success, betray the excellent benevolent spirit with which he was actuated, He says:

"Corn carried, let such as be poor go and glean,
And after thy cattle, to mouth it up clean;
Then spare it for rowen till Michel be past,
To lengthen thy dairy, no better thou hast.

"In harvest-time, harvest folk, servants and all,
Should make altogether good cheer in their hall;
And fill out the black bowl of blythe to their song,
And let them be merry all harvest-time long.

"Once ended thy harvest, let none be beguiled;
Please such as did help thee—man woman, and
child.
Thus doing, with alway, such help as they can;
Thou winnest the praise of the labouring man.

"Now look up to God-ward, let tongue never cease
In thanking of Him for his mighty increase,
Accept my good will—for a proof go and try;
The better thou thrivest, the gladder am I."

The "Book of Husbandry" of Tusser is also interesting from the information it gives us with regard to the customs and habits of the farmers of more than two centuries and a-half since. It is evident that they then lived very much upon salt fish, for in his directions for the farmer's diet, he mentions for Lent herrings and salt fish—at Easter they had veal and bacon—at Martinmas, beef—before the feast of St. John, mackerel—fresh herrings at Michaelmas—at Hallowtide, prats and spurlings—for Christmas fare they seemed to have all the modern standing dishes:

"Good bread and good drink, a good fire in the
hall,
Brawn-pudding and souse, and good mustard
withal;
Beef, mutton, and pork, shred pies of the best,
Pig, veal, goose, and capon, and turkey well drest."

They evidently, however, lived generally very frugally:

"Where fish is scant and fruit of trees,
Supply that want with butter and cheese,
Quoth Tusser."

They bought, in Tusser's time, such stocks of salt fish as would amaze a modern farmer in these protestant days, when, by the increase of green winter food, cattle and sheep are kept easily through the winter, and fresh meat is always to be had. Few farmers would now think of undertaking a journey to buy fish; yet he directed the farmer of the sixteenth century—

"When harvest is ended, take shipping or ride,
Ling, salt-fish, and herring for Lent to provide;
Get home that is bought, and go stack it up dry,
With pease-straw between it, the safer to lie."

Such was the work of Tusser. That it was popular, is evidenced by the rapid succession of copious editions which fell to its lot. If he had spoken in prose, as has been sometimes suggested, he would probably have been more instructive to the few, but he would not have been read by the many. The popular details and histories of nations escaping from rudeness are commonly given in verse; and many can learn these, who are unable to read. Tusser, therefore, is deserving of the gratitude of the English farmer; for his labours tended, in the primitive days of England's agriculture, to improve the profession he celebrated in his verses.

More than half-a-century elapsed, after Tusser's work appeared, before Gervase Markham, in 1620, published his "Farewell to Husbandry" — the most carefully written of his voluminous works. This, as I have before remarked, was entirely descriptive of the rural practices of his time. Artificial manures had even then begun to attract attention. For instance, Markham was aware of the fertilizing power of salt; but then he mistook the amount of the necessary quantity to be applied per "aker." He was more correct in his directions for steeping the seed-wheat in brine, made "so strong that it will beare an egge," of which recipe he very reasonably predicts "that the use therof will never be layde downe in this kingdome." His directions to use all kinds of other manures are frequent and fervent. He notices the burning of earth and weedes, which he calls "burning of baite"—the dung of live-stock, rotten straw, "mudde of ponds and ditches," "the spyteling of house-floores," street-sweepings, seaweeds, pigeon's dung. He even had the wisdom, in that early day for the progress of agricultural discoveries, to plead earnestly for the use of manure *with the seed.* He says, "Take pigeon's dung or pullen's dung (that is, any kind of lande fowle whatsoever, but by no means any water fowl), or pigeon's dung and pullen's dung mixt together, and allowing to every acre two or three bushells thereof, which is the true quantitie of seede proportioned for the same; and this dung being broken and masht into small pieces, you shall put into your sydlop or hopper, and in the same manner as you sowe your corne, you shall sowe this dung upon the ground, and then immediately after it you shall sowe your wheate, either steept in brine or salt sea water, or unsteeped, as you shall think good; but in case you can neither get salt sand nor sea rocke weedes, then you shall by no means omit the steepeing of your seede, neither shall you faile before you sow your seede to mixe withe your pigeons' and pullens' dung a full equal part of bay salt well dried and broken."

Of Sir Hugh Platte, who was Markham's cotemporary, and published in 1594 his "Jewel House," we know but little. He was a lawyer, and of Lincolnshire; had an estate near St. Alban's, and a garden in St. Martin's-lane. He was described by Weston as "the most ingenious husbandman of the age he lived in."

It will be interesting to my readers if I endeavour to trace the progress of agriculture in England, from the date of the publication, in 1532, of the three or four earliest of works on English husbandry, till the close of the sixteenth century—"the period (about 1700) remarkable for the introduction of turnips into our field husbandry. It happens that, by the care and researches of several members of the Cullum family, the progress of farming in the Suffolk parish of Hawsted has been traced from an early period, with very tolerable accuracy" *(History of Hawsted,* by Sir J. Cullum, Bart.).

The soil of this parish (which is situated about three miles south-west of Bury St. Edmunds) is a light-coloured, strong loam. In this is situated the old mansion and estates of the Cullum family; and, from the documents in their possession, and other authorities, the history of the parish was compiled.

From these it appears (p. 229) that in 1536 four acres of arable land were let for four shillings a year, seven acres for five shillings, and about twenty-five acres called "Clopton's Closes" for twenty shillings a year. Ten years after this, the rent of land began, seemingly, to increase; for in 1546 two acres and three roods of meadow, on the estate, were let for fourteen shillings a year, and half an acre for two shillings and sixpence. At the expiration of another quarter of a century we find the rent still at the old value; for in 1572 thirty-nine acres of the Cullum estate, consisting of "londe meadowe and pasture," were let for twenty-one years for four pounds nine shillings a year, which is about two shillings and three-pence per acre.

The skilful modern agriculturist may be curious to discover, from the terms of a lease made of a farm three centuries since, what were the brief stipulations of a Suffolk landlord in the rather primitive times of good Queen Bess. Sir J. Cullum enables us to answer the question. The landlord reserved to himself the liberty of *haying* (rabbit-netting), hunting, and fowling, with power to distrain upon default of payment on the usual days, and to re-enter upon default of a month. The tenant might stubb and grubb the *bushes* and *briers* growing in the grounds, and *eare* (plough), break up, and put in tillage all the pasture-grounds, *except the borders about the same where there grew either wood or timber,* and might crop, lop, and shred such trees as had been used to be cropped, lopped, and shreded, but no other. He was also to lay and leave the *earable* land to pasture one whole year before the end of the lease.

The husbandry of the grass-lands of Hawsted was then, evidently, that of a slovenly time; for these bushes and briars are commonly named in the leases of that day.

After the date of the above-mentioned lease, it seems that the landlord of Hawsted deemed it necessary no longer to be content with granting leave to the tenant to clear the fields of these bushes; for in 1574, 1575, and 1577, the tenants were made to covenant that "they *will* stubb and reat up" these encumbrances. They were encouraged to this by having the bushes for their trouble. This, however, was probably then done in a very unhusbandlike manner, as it was to be repeated annually.

It was in 1593, sixteen years after the date of these leases, that 231 acres, being parcels of land within or near Hawsted Park, were let for three years for £57 13s. 9d., or nearly five shillings an acre; and 76 acres and 1 rood of pasture and wood (the last 13 acres 3 roods) for £16 a year, which is above 4s. 3d. per acre.

The produce of the grass-land was probably poor. Arable soils were hardly better managed; for old Harrison, who published his description of Brittain in 1577, gives but a poor account of the average produce of the island. And this he does although evidently inclined to think well of the farming of his time. He tells us that in *ordinary years* each acre of wheat, one with another, throughout the kingdom, if *well tilled and dressed,* would yield 20 bushells, of barley 26, of oats and such-like 5 quarters.

The farm-houses of those days were of a very rude description. Glass windows, now far from being deemed a rarity, were only then beginning to be introduced into the houses of the husbandman. There is no mention of them in the papers of the Hawsted estate until 1615, when the tenant of the farm and park was to be allowed by the next tenant half the expenses he should incur for locks and keys, hooks, hinges, and *glass windows.*

From these notices, however, we may discern that the farmers of England had evidently advanced in skill and capital since Grotehead, Fitzherbert, and Tusser wrote their Books of Husbandry. Quaint and lively old Harrison noted these things in the year 1577, when he says, "Certainly the soyle is even now, in these our dayes, growne to bee much more fruitefull than it hath been in times past. The cause is that our countriemen are growne to be more paynefull, skilfull, and carefull, *thorowe recompence of gayne*, insomuch that my synchroni, or time felowes, can reap at thys present great commoditye in lyttle roume: whereas of late years a great compasse has yeelded but small profite, and thys onelye thorowe the idle and negligent occupation of such as manured, and had the same in occupying."

In another place, Harrison thus exults at the greatly-improved domestic comforts of his contemporaries in the rural districts:

> "So common were all sorts of *treene* (wooden) vessels in old time, that a man should hardly find four peices of pewter (of which one peradventure was a salte) in a good farmers house; and yet, for all this frugality (if it may be so justly called), they were scarce able to live, and pay their rents at their days, without selling of a horse, or a cow, or more, although they paid but four pounds, at the uttermost, by the year. Such also was their poverty, that if some one od farmer or husbandman had been at the alehouse, a thing greatly used in those days, amongst six or seven of his neighbours, and there in a bravery, to show what store he had, did cast down his purse unto them, and therein a noble or six shillings in silver, it was very likely that all the rest could not lay down so much against it. Whereas in my time, although peradventure four pound of old rent be improved to forty or fifty pound, yet will the farmer think his gains very small towards the midst of his term, if he have not six or seven years rent lying by him, therewith to purchase a new lease; besides a fair garnish of pewter on his cowbord, three or four feather beds, so many coverlets, and carpets of tapestry, a silver salte, a bowle for wine (if not a whole nest) and a dozen of spoons, to furnish up the sute. This also he taketh to be his own clear; for what stock soever of money he gathereth in all his years, it is often seen that the landlord will take such order with him for the same, when he reneweth the lease (which is commonly eight or ten years before it be expired, sith it is now grown almost into a custom, that if he come not to his lord so long before, another shall step in for a reversion, and so defeat him outright), that it shall never trouble him more than the hair of his beard when the barber hath washed and shaven it from his chin."

Tusser talks also of fines and high rents:

> "Great fines so neere did pare me,
> Great rent so much did skare me,
> Though country health long staid me,
> Yet lease expiring fraid me."

In 1682 the following wages of servants and labourers in husbandry were appointed at the Quarter Sessions held on the 24th of April at Bury St. Edmunds—

WAGES BY THE YEAR.

	£	s.	d.
A bayliffe in husbandry..	6	0	0
A chief husbandman or carter	5	0	0
A second husbandman above 18 years of age	3	10	0
A fourth, under 18	2	10	0
A dairy-maid or cook	2	10	0
An ordinary harvest-man	0	18	0

WAGES BY THE DAY.

A man haymaker, with meat and drink	0	0	5
A woman haymaker	0	0	3
A man reaper in harvest	0	0	10
A woman reaper..	0	0	6
A common labourer at other times:			
In summer	0	0	6
In winter	0	0	5
Women and such persons, weeders ..	0	0	3

Without meat and drink, their wages were doubled.

It was about a century after the time of the earliest English writers on husbandry, that Walter Blithe commenced his labours. He lived at Newcastle; and in 1649 published his work, entitled, "The English Improver, or a New Survey of Husbandry." In his title-page, which, like most of those of the books of his time, was a very copious affair, he gives perhaps the earliest notice with regard to "floating or watering such lands as are capable thereof"; and also, by "drayning," reducing "boggy or drowned land to sound pasture."

Writing in the days of the Commonwealth, he dedicated his work to the members "of the high and honourable houses of Parliament"; and it is impossible to read his modest book without perceiving how far before his time was honest Captain Walter Blithe. He was the first who advocated tenant-right. He says in his preface, what has often enough been since contended, that "the first prejudice is, that if a tenant be at never so great pains or cost for the improvement of his land, he doth thereby occasion but a greater rack upon himself; or else invests his landlord into his cost and labour gratis, or at best lies at his landlord's mercy for requital, which occasions a neglect of all good husbandry. Now this I humbly conceive may be removed if there were a law enacted whereby every landlord should be obliged either to give him reasonable allowance for his clear improvement, or else suffer him or his to enjoy it so much longer, as till he hath had a proportionable requital."

The irrigation improvements of Blithe of course were opposed and thwarted in every way. He proceeds to tell us that "the second prejudice is against that great improvement by floating lands, which exposeth the improver to a suit of law for turning a water-course, by millers or others which are minded to molest the improvement. Myself am a precedent herein. I made a good improvement upon a little brook above half a mile above a water-mill. I turned the water-course upon my land, and turned it again into the course half a mile before it came unto his mill. He sues me at common law, and recovers against me. My improvement was from six load of hay to twenty, his prejudice little or nothing; for which no composition would serve but the ruin of it, which by this verdict was accomplished."

Blithe, indeed, well understood the value of water-meads, and of the necessity of *well draining them*, so that, as he says, "nothing shall remain behind but the sludge, fatnesse, or thicknesse of the water." And this drainage, as he observes, must be deep; or to use his own words, "Indeed, the excellency of this is in draining out all the water again, and going below any springy, boggy matter, in order to fetch it out of the ground, which, indeed, is the venom and poison of it." It might serve to make us more modest in our estimate of the knowledge of our time, if we collated the work before us with some recent controversies on sewage irrigation.

Blithe shared the fate of all those who boldly strike out from well-beaten paths, apply new principles, and make novel assertions. He feelingly tells us that he presents "a rude draught of some of his own experiences, though purchased to himself at a thousand-fold dearer rate, all which," he adds, "have caused both his thoughts and practices to be made legible, and himself the subject of every opinion, wise or weak; and though dogs bark and join together in their clamor against those they know not, yet he hopes the ingenuous honest reader will not speak evil, or condemn before hearing or offence given."

He was evidently strongly opposed and ridiculed in his clever advocacy of under-drainage and of irrigation. He, like all other first explorers, spent considerable sums in experiments, of which others reaped the benefit—expenses which materially spoilt the appearance of his balance-sheet. His was a fate which many have since experienced. It was thus that, in the same century, Jethro Tull, who invented the horse-hoe and the drill, was taunted by his cotemporaries with having "drilled away his fortune." It was in such a spirit that Bakewell was asked how, and why, he lost by his noble sheep?—the Collings, why they were so poorly rewarded, in a pecuniary point of view, by their splendid herds of shorthorns? The same objections are unfairly raised even now on almost every possible occasion, against those who are experimentally and boldly endeavouring to improve their lands; the question is far too often asked of such improvers—"Where is your balance-sheet?" There is commonly much too great a readiness to confound the advocate (especially if, like many a great friend of the profession, he is an interloper of agriculture) with the arguments he employs and the valuable facts he produces. It was in such a spirit objected to Tull, as an improver of tillage, that he was a barrister; to the inventor of the thrashing-machine, that he was a Scotch advocate; to the author of the reaping-machine, that he was merely a minister of a Scotch kirk; and to the first introducer of the use of superphosphate of lime, that he was only a German chemist!!

THE HERDS OF GREAT BRITAIN.

CHAP. XV.

THE BROUGHTON HERD.

It has been said with truth, that "few who travel up the valley of the Aire, on their way to Scotland, dream that one of the brightest and most beautiful of gardens in the north of England, lies embosomed there, amongst magnificent beeches and time-honoured specimens of yew." The lover of Shorthorns, however, if he only glances from the railway carriage window at the rich pastures through which he is whirled, would never be brought to share the florist's surprise, even if he had never heard of the glories of "Tom Mason and Peach," or read of his pupil Culshaw's vow by the side of his first boyish love, April Daisy, of Greenholme, "to rear some of the sort, or even better than her." After a most miserable twenty-four hours at the Burnley Inn, with only the pattering of the rain and the factory clogs for our music by day, and a thundering diapason, with a sheet lightning accompaniment by night, it seemed when Broughton Hall was reached, as if we had been the subjects of some Lyceum drop-scene magic, and that "The gloomy Cave of Despair" had been succeeded by "the Valley of Calm Delights," full of geraniums and Harbinger heifers. We know not when flowers began to play such an important part, but although the pedigrees were uncared for, the Tempest family have taken an especial pride in cattle since the beginning of the century; and in 1808, Mr. Tempest, the father of the present baronet, refused £160 for two fat cows. The herd was originally commenced by Sir Charles, in 1828, three years after his father's death. Mr. Whitaker was his first Mentor, and many were the journeys which his bailiff (Mason) undertook with Tim Metcalf, as "consulting counsel," through the North Riding, in search of clever things.

True to the floral connection, Verbena, bred by Mr. How, of Coldstream, was the first cow of mark under the new era at Broughton. She was by a son of Wellington (679), from a cow bred by Mr. Robertson, of Ladykirk, who had used the best of the Collings' bulls. Her produce in Sir Charles's hands was Vestris by Cato (1794), and Vanity by Sir Walter (2638). The former bred eleven calves, and the latter nine, the most part of them by Mr. Whitaker's Frederick (1060), and Mr. Fawkes's Norfolk (2377). Bella, by Bertram (1716), was bought at Mr. Whitaker's sale in 1833, and calved Beauty by De Vœux a few minutes after she reached her new home. At Mr. Richard Booth's sale in '34, Sir Charles made a bolder venture, and gave 100 gs. for the young bull Brutus (1752). Duchess, who did not breed, and Fair Helen by Young Albion, who had already produced in Mr. Booth's possession Cossack (the sire of Clementi and Collard, both of which fetched 200 gs. a piece in Mr. Parkinson's hands, when under one year old), were his other Studley purchases.

Among Fair Helen's calves were Strawberry, Angelica, Queen of Trumps, Victoria, and Miss Bayley by Brutus; and the latter was the first animal that Sir Charles ever showed at Smithfield, the year before the gold medal was won by Nina Lassave by Scrip (2604), from the Castle Howard sort, whom he had bred and sold to her exhibitor, Mr. Maxwell of Everingham Park. Those were days when fat cows had no reprieves on their way to the block, and hence the "unfortunate Miss Bayley" was not to be found in Baker-street that Christmas. Peach by Edmund 2nd (3693), from Pine Apple by Norfolk, g. d. Vestris by Cato, was sent to do battle in 1843; and it is still a moot point among those who can remember every show there, whether she or Beauty's Butterfly is the most worthy gold medallist. Many considered that Peach (who had the advantage by a year) was more massive, while the white had greater purity of character, and a better head and neck-vein. We heard one of the old judges stoutly disputing the point with Culshaw, who was the under-herdsman at Broughton, when Peach was got ready. The late Lord Spencer was in raptures with her, but he was promptly assured by Mason, when he doubted whether her equal or superior would ever arise, that "we have the model at home." Be this as it might, Sir Charles's name, after this unparalleled double success, was seen in the Smithfield list no more; "the model" Pine Apple was choaked with a turnip a month before calving a heifer to Mr. Eastwood's Harlsonia; and Peach, for whom 80 gs. had been offered before she left for London, was taken back and sold to Mr. Jas. Teaby, to slaughter. A celebrated New York breeder begged as an especial favour to have her modelled, and portraits of both her and Nina Lassave are to be seen in the first and second parts of the fifth volume of Coates's Herd Book.

Fancy, by Remus (2524), was a good purchase of Mason's from Mr. Cattley, of Brandsby, and gratified Sir Charles's fondness for good milking to the full, as she often gave twenty quarts a day, for months together after calving. Fashion by Berryman was her best, and from Fashion came a bull Delcroux by Buckingham, who was bought by the late Earl Ducie for 150 gs., on one of his visits to Broughton. Of course, his lordship "smoked a cigar over him," before he decided, and sat on a chair in the pasture, while Mason went to dinner, leaving the boy Culshaw to herd the cows close round him. He had made up his mind to bring "the hug-bellied bull," when Mason came back, and then the conversation ensued, which brought Knowles to Tortworth. Violet from Vestris was born six weeks before her time, without an atom or hair on her, and was brought up with a lamb. The teapot system suited her so well that she acquired a propensity to fatten, which no treatment could subdue. As a last resource, they put her to feed in a wood with a Scot; but although the herbage was such, that the latter would stand it no longer, be the fence what it might, Violet bloomed as of yore, and came out of her penal servitude with a coat as long and matted as its early companions. Lily was one of her calves, and after being weighed to something like nine stone a quarter at nine months, she was shown as a yearling, and won the first prize at York. Her calf Lavender became to Lord Ducie's for the highest price at the sale; and Sir Charles's greatest show yards triumphs were achieved by its sire, the red Dan O'Connell (3557), by Berryman (2144), from Daisy, a Fairfax cow, which Mason picked up in his pilgrimages. Dan went with eleven others from the herd to the Yorkshire show at Leeds, 1840, and his four victories, two of which were in sweepstakes for the best yearling bull, and the best bull of any age, contributed no small quota to the £96 worth of prizes which came back to Broughton. Lord Spencer shared in the universal admiration for Dan, and when he looked over the lot the night before the show, he unhesitatingly said, "I can beat all the females, but I cannot beat this." Splendour, another of the Broughton Berrymans, was sold to Mr. Eastwood; and Rockingham (2550), a very good heifer-getter, also bravely carried on the Fairfax line. Earl Carlisle's agent twice or three times refused to put any price on Rockingham; and Sir Charles fancied him so much, from the account he heard of his stock, that he went prepared to give 500 gs. at the Castle Howard sale, and got him for 65. This was in 1838, when he was seven years old; and he lived on in use at Broughton till he was fourteen. He was then presented as a Christmas-box to Culshaw, who remembers feelingly to this day that he only received a dividend of 13s. 4d. in the £ (and a blessing) out of the £6 for which he sold him. He was from a daughter of Lady Sarah, the dam of the well-known Castle Howard Belshazzar, and sister to Richard Booth's famous Isabella by Pilot, from "White cow by Agamemnon." Such was Rockingham's odd temper, that it was with the greatest difficulty they got him snared into the van at all, to remove him from one Riding to the other; and their usual mode of proceeding at home, when his services were required, was to open the door and run for it, and leave the dog, to whom he alone owed allegiance, to drive him in again as he could.

Three years before this strange partnership ended, Buchan Hero (3238) had become the premier. His story was on this wise: Mason had gone to the Highland show at Berwick in 1842, to try and purchase a bull, and was so much struck with the Hero's looks, as he filed in among the others to the show-yard, that he had him priced at 200 gs., which his owner seemed to think hardly enough when he found him A 1 that day. Sir Charles and Mr. Whitaker joined in this bargain; and at the latter gentleman's sale in 1844 he was bought out for 350 gs. (the highest hammer price for a bull since Robert Collings's sale), after a severe contest with Mons. St. Marie on behalf of the French Government. He was a very nice high-bred bull, with fine hair and quality and a pale face; but did not prove one of the best. The dam of Puritan, Lady Buchan Fairfax, for whom Lord Ducie gave 150 gs. at the same sale when a calf, was one of his finest daughters; and old Fancy also produced a good Broughton Hero by him. Mehemet Ali (7227), a rich roan, by Mussulman, introduced some Lax blood about the same time; but he died early, of lung disease: and his fine looks and promise made his loss one of the worst the herd ever sustained. In 1846 Mr. John Booth's Mowbray (7260), a son of Morning Star (6223) and Mantalini, was hired; but he also died at his new home without getting many calves. A few months before, Sir Charles had been a spirited buyer at Mr. Watson of Walkeringham's sale. One of his purchases, Strawberry, bred Tom of Lincoln (8714), by Lord Adolphus Fairfax; and the other, the renowned Barmpton Rose, a very fine Big Tom by Tom of Lincoln. Lord Ducie bought the old cow, whose fine outline and "Durham ox head" gave such an unmistakeable stamp to her, for 82 gs. at the Broughton sale, and but for Big Tom being such a miserable object from cripple felon, his lordship would not have separated the two at any price. The old cow did him no good, but she had done enough for her fame before she came to Tortworth, by laying the foundation through Buttercup, of the Royal Butterfly line. After the sale Liberator (7140), bred by Sir Charles himself, was principally used in the formation of the new herd. He had been sold from Broughton at a few weeks old for 100 gs. to Mr. Linton, of Sheriff Hutton, and won several prizes in his hands; and his son Fair Eclipse (11456), bred by Mr. Cattley, of Brandsby; California, who was purchased along with his dam, from Mr. Unthank, and Mr. Booth's Harbinger and Prince Oscar, have been the princes of the bull-yard since then, in succession.

The herd at present consists of from 60 to 70 head, 25 of which are cows in milk. The home farm includes about 300 acres, some 30 of which are under plough; and the 10 acres which are devoted to orange globe mangels and turnips, not unfrequently produce 40 tons per acre, bus as the land is not deep, and on rather a cold bottom, it it not calculated for growing the long red mangels. The farmyard lies about 200 yards from the hall, rather a tantalizing proximity, as Sir Charles was once strictly forbidden by his medical attendants to enter it for three long years, in consequence of a severe attack of malaria fever. The buildings are plain and substantial, principally ranged round a yard; and gas is laid on with a jet inside each window, so as to dispel both the inner and outer darkness.

Entering a low-pitched, comfortable old byre, we were first introduced to the junior of the herd, in the sweet-headed, deep-ribbed, roan heifer calf by Peter Simple, a son of Booth's Harbinger, and straining back to the Dan O'Connell sort. The rich hair and fine substance which Harbinger has put on to this stock—and, in fact, wherever he went—told its own tale in Harmless from Mayflower, whom we found in a box on one side of an archway. She was only a year old on August 26th, and, after beating Mr. Torr's Wave Hope for the heifer-calf prize at Hull, and winning a similar first prize at the Royal North Lancashire at Blackburn, she came out and won as a yearling on the home circuit at Skipton. Prince Oscar by Crown Prince was hired as a calf, and finished Harbinger's second year out at Broughton; and we had evidence to the fact in Prince Frederick from Crinoline, and the red Rocket from Merry Bird, who both struggled out together in the herdsman's halter. They were remarkably neat in the head; but the latter, on the whole, was our favourite. Patriot, by Harbinger from Perfume, was next in order; and then Punster from Dora (a great grand-daughter of Dan O'Connell), a very choice rich-haired roan calf, with a beautiful back, and neater offal than any we had seen. To this succeeded a heifer calf with a remarkably good head and fine depth and quarters by Prince Oscar from Vanity, a combination of Harbinger and California, which set the grand-daughter of Off-she-Goes, who is somewhat staring in its colour, and not so good in its middle, somewhat at a discount.

After meeting the Emperor Napoleon by Duke of Cambridge (12728) so often at shows, and hearing so many doubts of his fertility, we were rather curious to see how that wondrous cylinder would bear stripping. He was only begun with for the first time in the October of 1858, as Sir Charles was of course anxious to use Prince Oscar to the last, and they have now upwards of a dozen calves by him. Mr. Unthank bred him; and as he will be only four years old next March, we look back in wonder at his massive proportions, when he was shown among the aged bulls at Chester and Northallerton. His quarters, back, and flank are very good, and, take him altogether, he is an animal who will always repay a second look, although he rather lacks grandeur about the head. He was second to Mr. Fawkes's Sir Edmund Lyons as a yearling bull at the Yorkshire Show in 1857, and has won eight first prizes since then in the Northern counties. Peter Simple by Harbinger from Flame then showed from the opposite side of the yard. This Keighley prizeman is a thick but not a very elegant or level bull, with somewhat too staring hips. In his head and back he considerably resembles the old bull, and shows the prominent Booth rib, and a good share of quality to boot. His white half-sister Surplus from Slut by Fair Eclipse won both as a yearling and a two-year-old at Keighley and Skipton, and with the exception of being a trifle patchy, we thought her as thick and good a heifer as we had seen, and with a remarkably good back and bosom. Rifleman by Vanguard, whose head he inherits, was the last of the old bull division. He was bred by Mr. Torr and sold to a Skipton Company, but he knocked down one of the subscribers, and injured him so severely, that they were fain to get quit of him.

After hearing this, we moved an adjournment to the pastures behind, past a lot of store pigs of the large white breed, and the circular chimney of the saw-pit, which with ivy clinging round it to its very summit, forms no eye-sore to the beautiful garden behind. The sawing is very deftly managed with a table on railway-wheels, to suit all lengths of logs, and a crusher for oats and oilcake is attached to the same machinery. We met with nothing among the thorns and beeches which stud the home-park so profusely, except the sheep (which are principally a cross between the Cheviots and the Southdowns), and Merry Bird by Fair Eclipse. She is the dam of Crinoline, who was one of the first pointed out to us in the pastures on the other side of the beautifully wooded gorge, which seems to steal away by the side of the brook towards Skipton, and the distant grouse fells. The white was an old acquaintance, and although she has grown rather more patchy and larger on the hips since then, it was not difficult to recognize the nice offal and true parallelogram shape, which gave her that Cumberland and Westmoreland Cup in 1858, as the best animal in the yard, which Mr. Ambler's Prince Talleyrand won last year. Mayflower was another of the whites, and we could not dispute the justice of the decision, which lately placed her behind Crinoline at Skipton; and Off-She-Goes, who had her Prince Oscar bull-calf at her side, soon impressed herself upon us, as she stood up, and looked proudly round with all the air of old Cambridge Rose 6th, when she faced Mr. Strafford in the ring at Cobham. Rosette the dam of Slut can never be out of favour at Broughton, if she can continue to show such a bag; and five Prince Oscar heifer calves, one of them with a good coat of bad colour, and a couple of nice heifers, by Prince George, were our other principal attractions on Goosemire, and the two fields adjoining.

A slight circuit brought us to that special pride of Broughton Hall, the scroll pattern garden which Nesfield designed, and which is said to have scarcely a peer in the world. We must, however, leave it to others, to tell how the "red, white, and blue" and purple, and yellow gravels are all blended into harmony, with the Prince of Orange Calceolarias, the blue Lobelias, or the King Verbena ; how "the purple Zelinda plays a conspicuous part in one of the most beautiful and telling ribbons;" how *Abutilon striatum* was in great beauty, and how *Abrothamus elegans* was blooming profusely. Those mysteries of floral craft are not for us. The "most beautiful and telling ribbons" in our eyes, are those which mark out the first prize in a show yard, and anon with a glance at the spacious Grecian conservatory, and the fountain with the five seamonsters' heads, we find ourselves on the terrace in front of the Hall, with the ten-year-old Miss O'Connell beneath, and listening to her history from the lips of her old guardian, who now occupies a farm at Stainton near Skipton. This daughter of Liberator the last son of Dan O'Connell has always been an immense favourite with her master, and even the patchiness which age has brought with it, takes off but little from her grand form, to which her head with its peculiar horn lends such remarkable character. The O'Connell blood had met us everywhere throughout the day, and the sight of this venerable matron formed an appropriate close.

H. H. D.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A Monthly Council was held on Wednesday, Feb. 1, Lord Walsingham, President, in the chair. Present :

Lord Berners, Lord Feversham, Lord Leigh, the Hon. Col. Nelson Hood, the Hon. Augustus Vernon, Sir J. V. Shelley, Bart., M.P., Mr. T. Dyke Acland, Mr. T. Raymond Barker, Mr. Hodgson Barrow, M.P., Mr. Bramston, M.P., Mr. Brandreth, Mr. Caldwell, Col. Challoner, Mr. Exall, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Wren Hoskyns, Mr. Hudson (of Castleacre), Mr. Jonas, Mr. Lawes, Mr. Lawrence, Mr. Milward, Mr. Shuttleworth, Mr. Torr, Mr. Jona-Webb, Mr. Burch Western, Mr. Wilson (of Stowlangstoft), Professor Simonds, and Professor Voelcker.

The following new members were elected :—

Awbrey, F. D., St. Lawrence Woolton, Basingstoke.
Beaumont, F. H., Buckland Court, Reigate.
Bryan, John, Southleigh, Witney.
Burch, W., Campsey Ash, Woodbridge.
Curtis, Capt. Constable, Pailton House, Lutterworth.
Davies, R. B., Ridgeway, Narbeth.
Drew, H., Peamore, Exeter.
Gadesden, A. W., Leigh House, Tooting.
Gascoyne, W., Bapchild Court, Sittingbourne.
Gray, Rev. J. D., Abbdsley, St. Neots.
Hipwell, G. M., Cheam.
Lennard, Sir T. B., Bart., Ballins House, Aveley, Romford.
Murton, William, Tunstall, Sittingbourne.
Plumbe, John, Ashton Keynes, Cricklade.
Pollock, G. D., 27, Grosvenor-street, W.
Reid, Sir J. Rae, Bart., The Grove, Ewell.
De Rothschilde, Sir. A. Bart., Aston, Clinton Tring.
Surman, John Surman, Swindon Hall, Cheltenham.
Tinkler, R., Penrith.
Welby, J. E., Allington Hall, Grantham.
Winstanley, J. B., Braunston House, Leicestershire.

The names of sixteen candidates for election were then read.

Finances.—The Hon. Colonel Nelson Hood presented the report of the Finance Committee, from which it appeared that the current cash balance in the hands of the bankers on Jan. 31, 1860, was £3,634 15s. The Chairman further reported that the authorities at Canterbury had transmitted to the Society, towards the expenses of the ensuing country meeting, to be held at that city in the week commencing Monday, July 9 next, a subscription of £1,500, which was included in that general balance.

Canterbury Meeting.—Lord Leigh, Vice-Chairman of the General Canterbury Committee, reported their recommendation of the plan of the Show-yard submitted to them by the Hon. Director of the Show and the Society's Contractor of Works. His Lordship also submitted a list of Prizes which had been offered by the Local Committee at Canterbury, and which was accepted with thanks and ordered to be appended to the Prize Sheets of the Society.

Standing Committees.—The Standing Committees for the year were appointed.

On the motion of Mr. Torr, seconded by Sir John Shelley, the consideration of the best manner of conveying the thanks of the Council to Mr. Brandreth Gibbs for his services as Honorary Secretary of the Society during a period of seven months, was referred to a Committee, who should report to the next Monthly Council.

The Annual Report of the Royal Veterinary College was received, and directed to be read at the next Weekly Council.

The Council then adjourned to its Weekly Meeting on the 8th inst.

A Weekly Council was held on the 8th instant, Lord Walsingham, President, in the chair. Present : Sir J. V. Shelley, Bart., M.P.; Sir J. V. B. Johnstone, Bart, M.P.; Mr. Dyke Acland, Mr. C. Barnett, Mr. George von Bunsen, Mr. Henry Corbet, Mr. B. T. Brandreth Gibbs, the Rev. L. Vernon Harcourt, Mr. Thos. Scott, Professor Simonds, Mr. Thompson, M.P., Mr. B. Western.

The names of candidates for election were read.

Annual Veterinary Report.—The annual Report from the Governors of the Royal Veterinary College was then read, of which the following are the principal points—

The Governors, after stating the gratification felt at the harmony which had so long existed between the two Institutions, express a wish to learn of the Council whether by a modification of its rules relating to the professional visits of the veterinary inspector an arrangement could not be effected whereby more numerous applications for his services would come from the members of the Society. The Governors conceive that inquiries on the spot should be made into sudden or extensive outbreaks of disease of an unusual character among animals; but that an equally searching investigation should take place into the causes of the more common forms of disease with which cattle, sheep, and pigs are affected; as these, if unchecked or wrongly dealt with, will not unfrequently produce untoward results of almost equal importance. They would wish to urge on the members of the Society, not only the necessity of a continuance of the practice of referring numerous specimens of disease, accompanied by a history of the cases in which they occurred, to the College, but even its still greater extension. The Lectures have been regularly attended by the entire class of pupils, which exceeds in number the average of former years; and it is gratifying to the Governors to be enabled to state that the examinations show the proficiency of pupils in the subjects of the extended curriculum which was originally required by the Council. The epizoötic maladies, known familiarly as the "lung disease," and the "mouth and foot affection," have been as rife during the first as in almost any preceding year, and consequently have produced great losses among agricultural stock. The nature of the changes which take place in the lungs, by the former of these maladies, is such, that under all varieties of treatment and management it must ever remain a most destructive disease; and in consequence, also, of its contagious nature, it is difficult to see how, without special legislative enactments, its effects or extension can be controlled. Besides these diseases, several others have been prevalent during the year, especially among sheep, some of which were found to depend on the existence of entozoa within the true digestive stomach of the animal, and others on the presence of similar worms within the windpipe and air-tubes of the lungs. Numerous letters, seeking advice under these circumstances, have been received; and the directions for the treatment and general management of the animals given in reply have, almost without an exception, been acknowledged to have produced the desired effect.

Lord Walsingham inquired of Professor Simonds as to the entozoa existing in the stomachs of lambs.

Professor Simonds stated in reply to several questions from members that the entozoa met with in the true digestive organs of lambs were the cause of the death of many of these animals. These worms often existed in large quantities, thickly besetting the mucous coat and having their heads firmly embedded in it. Their expulsion or detachment was prevented by a barbed state of the skin near the head of the worm, but which the creature could depress when moving from spot to spot. The large quantity of nutriment partaken of by those entozoa ultimately anæmiated the animal. They were met with early in life, and while the lambs had every appearance of health, consequently they could not be viewed as an effect of the diseased state of the organism but as its cause. Professor Simonds also stated that many entozoa underwent transformation, and gave as an illustration the hydatid in the brain of sheep, the cause of the disease as being one stage of the development of the tapeworm of the dog in particular. He also stated that the measly condition of the flesh of pigs depended on the presence of hydatids, which in the digestive organs of other animals would develop into tapeworms; but that either the salting or cooking of pork would destroy the hydatids. Such food could be eaten with impunity, although it wanted nutritive properties. Oil of turpentine with linseed oil was among the most useful vermifuges. Sulphate of iron mixed in the food of lambs had been found very beneficial in the expulsion of the barbed worms from their stomachs.

Communications were received from

1. Mr. W. Melton, of Bathurst St. Mary's, River Gambia, transmitting a specimen of haulm of the Arrachide or Ground-nut.
2. Mr. Cadogan Williams, of Bridgend, Glamorganshire, on the means of securing corn in wet harvests.
3. Messrs. Hardy and Son, Seed Growers, Maldon, Essex, inclosing diagram of a clamp or shed for preserving roots in winter.
4. Mr. Bernard Boyle, 7, Tokenhouse Yard, submitting a plan for disposal of metropolitan sewage.
5. Mr. T. Hampton Corbet, of Whittington, Towcester, on the potato disease.
6. Mr. G. H. Bolton, of Warrington, on a method of determining the sex of future animals.
7. Mr. Thomas Turnor, Pool Park, Ruthin, North Wales, with a plan of a moveable cattle-shed.
8. Mr. James S. Randell, Rudloe Lodge, Chippenham, on the utilisation of sewage; and
9. Mons. le Pontois, 11, Rue des Colonies, L'Orient, France, forwarding specifications and designs of two new seed leps of his invention.

THE BUDGET, AND THE FARMER.

We have only to listen to the voice of the charmer, in the facts and figures adduced by the Chancellor of the Exchequer, in order to be convinced that we are a great nation. Ours is the most flourishing, prosperous, and progressive country on the face of the earth. To test the fact, we have but to apply the screw of the Income Tax—to pay our pence under the various schedules of so pleasant a charge, assessed for this financial year on £200,000,000—and we have forthwith an index of the wealth of the country. But, of all classes of society, "our old friend Mr. Farmer" (as the Chancellor facetiously speaks of him) ought to be particularly happy, seeing that, viewed in this pleasant kaleidoscope, he has improved his position in the past four years two or three per cent. more than the trading and professional branches of the community have. That is, of course, if we take this tax to be the infallible index of progress and general prosperity assumed for it, which is by no means so clear. Moreover, it must be remembered that the agricultural classes are the most heavily pressed in many ways, and that they have less opportunity or, indeed, disposition to make incorrect returns of income and profits, than the manufacturing and professional classes ranged under the other alphabetical schedules. But it is not all *couleur de rose*. If in the last six years the national wealth has advanced at the rate of 16½ per cent., the national expenditure has gone on much faster. We are spending, it appears, at the increased ratio of 58 per cent. So that, labouring under many heavy burdens, with all the prosperity so glowingly pictured forth by Mr. Gladstone, we cannot turn to a trade, profession, business, or industry, which is not just now complaining of depression or loss. We have invited unrestricted competition in every branch, and we have crippled several interests, and are likely to kill many more by the proposed measures. There is, however, a truly British feeling dominant, rising superior to all difficulties, that is not easily conquered. If knocked down by one blow it recovers itself and strikes out in another. Still, it is a continual and desperate struggle—an uncertainty of position and tenure of advantages, which no foresight, prudence, or perseverance can overcome. We have flooded every present available market with our manufactures, at ruinous sacrifices. Until at length, the producers, at their wits' end, are beginning to look round for other fields for competitive business, and considering what concessions can be made to get the introduction of the thin end of the wedge.

To this cause we are certainly indebted for the energetic labours of Mr. Cobden on the Continent, and the much discussed commercial treaty with France is the result. The concessions, however, made to our Continental neighbours, both under this treaty and in Mr. Gladstone's new budget, are very one-sided, and by no means calculated to be reciprocally beneficial, as we shall take occasion to show. We can all readily appreciate the imposition or reduction of home taxation, though we may not be able to form so prompt an opinion or appreciation of the benefits or disadvantages likely to arise from the concessions which France is to make to us. We shall therefore pass under notice first the proposed alterations propounded by Mr. Gladstone on Friday night in his long-expected budget. The deficit to be made up was about £9,400,000, and the various alterations and reductions proposed are estimated to give a relief of nearly £4,000,000 to the consumer, and cause a net loss to the revenue of about £2,000,000. Or, that is, a sum equal to the amount falling in from the cessation of Government annuities this year.

The war duties on tea and sugar, which have now been paid for three years, are to be maintained for a year longer, and, as a mainstay, the Chancellor again resorts to the Income Tax, which is expected to yield about £8,500,000, at the increased rate of 10d. in the pound on incomes above £150, and 7d. in the pound on those below that sum. But Mr. Gladstone proposes to make some large reductions of taxation, notwithstanding his financial position from increased expenditure upon the China war, and the naval and military estimates. The principal articles which he proposes to admit in future duty free, are the following :—

Duty charged.	Imports, 1858.	Gross Duty received. £.
Butter, 2s. 6d. and 5s. per cwt..	387566 cwts.	95489
Tallow, 1s. 6d. and 1d. per cwt..	1225181 cwts.	87665
Cheese, 2s. 6d. and 1s. 6d. per cwt.	364087 cwts.	44369
Eggs, 8d. and 4d. the cubic foot.	about 134½ millions	22426
Oranges and lemons, 8d. p. bush.	983777 bushels	32793
Nuts and walnuts, 1s. per bush.	239352 bushels	11966
Dates	26035 cwts.	7546
Nutmegs, 5d. and 1s. per lb.....	232834 lbs.	11383
Paper, various..................	—	10000
Liquorice paste and juice, 10s. and £1 per cwt.............	10726	8948

These, with some few other trifling articles, involve a loss of revenue of probably about £4,000,000. The excise duty on paper is to be swept away, at a sacrifice of £1,000,000. The duties to be reduced are—Timber sawn and split, and not sawn, from 10s. and 2s., and 7s. 6d. and 1s. a load, to the uniform rates of 2s. and 1s. respectively. The imports in 1858 were 2,185,286 loads, and the revenue paid on this was about £600,000, but the increased employment in shipbuilding and for other constructive purposes will, it is anticipated, lead to a recovery, and not entail a very great loss. Currants and figs are to be reduced from 15s. 9d. to 7s. per cwt. duty, and raisins from 10s. to 7s. per cwt. The imports of these in 1858 were :—Currants and figs, 422,577 cwts., paying £823,687 duty; and raisins, 357,485 cwts., paying £129,411.

It will thus be seen that the free raw materials are now greatly augmented, and, had the national finances permitted, would probably have been more largely extended. Again, such articles as butter, cheese, eggs, and green and dried fruits are also exempted or reduced, as indeed all articles of food, animal and vegetable, and the materials for manufactures, should be. We should gladly have seen the whole category of duties on spices swept from the Customs-list, so as to embrace mace, ginger, cloves, cassia lignea, cinnamon, and pimento, which scarcely yield in all £11,000 revenue; while pepper, bringing in £100,000, might also have been remitted. The repeal of the duty on paper, after the first July, removes excise interference from almost the last important manufacture, and unfetters the progress of a very important trade, which has largely advanced notwithstanding fiscal restrictions. In ten years the quantity of paper made was increased 71,000,000lbs., and the total quantity made is close upon 200,000,000lbs. The only check to its larger advance now will be the deficiency of raw material, although straw and every other available fibre have been pressed into service. This reduction involves a loss to the revenue of £1,000,000; but the remission of the duty effects a saving of £20,000 in the inland revenue department; while the abolition of the impressed newspaper stamp will also conduce to an economy at Somerset-house. Whatever saving of labour, however, this may make in one way will be more than counterbalanced by the immense inconvenience and trouble it will entail on the transmission of such papers as go through the post.

The duty on hops is to be reduced from 45s. to 14s. the cwt. This is a concession which has long been pressed for, and was requisite, seeing that the cheap introduction of foreign wines and spirits may have some influence on the consumption of malt-liquors. The average quantity of hops that have paid duty annually in the last three or four years has been about 50,000,000lbs, and Mr. Gladstone estimates the relief of duty at £105,000. The new duty of 1½d. per lb., however, is to be payable on the 1st of January after the charge. The foreign hop-grower is to be admitted into competition; but on what terms is not stated by Mr. Gladstone. At present the duty on foreign hops is £2 5s. the cwt. The imports in 1858, chiefly from Hamburgh, were 16,587 cwts., and the duty received £37,320.

In connection with this subject we may mention that petitions were presented last session to the Belgium Chamber of Representatives from several hop-growing districts—complaining of the disproportion between the trifling duty of 1 franc 30 centimes per 100 kilogrammes on foreign hops imported into Belgium, and the very heavy duties to which Belgium hops were subject in other countries; and praying that steps might be taken to secure a free trade, or else that retaliatory import duties, equivalent to those affecting Belgian hops, should be imposed on hops of foreign growth. The Committee to which these petitions were referred showed, by statistical facts, that the petitioners had nothing to fear from foreign competition, reported against any increase of duty, and recommended that efforts should be made to obtain from foreign Governments reciprocal freedom of trade in hops. From the reports of this committee it appears that in the five years ending with 1857, the quantity of hops exported from Belgium amounted to 8,626,954 kilogrammes, against an importation of 5,324,051 kilogrammes, and that the amount of the exports to Great Britain was 5,045,253 kilogrammes, against 269,448 kilogrammes of British hops imported into Belgium. In 1858, however, owing to the partial failure of the crop in Belgium, the imports of hops exceeded the exports—1,251,519 kilos. being received, against 706,281 kilos. shipped; and of these imports the large quantity of 868,697 kilogrammes was imported from Great Britain.

The malt credit is, like that on hops, to be limited from October next to six weeks instead of twelve weeks. The prohibition against the import of malt is to be removed, and a customs' duty of 3s. per bushel substituted. The quantity of malt made has varied but little of late years in the kingdom, averaging 40,000,000lbs. The removal of the duty on liquorice will be of use to the porter-brewer, who uses it pretty freely, and will probably employ it more extensively at the cheaper rate at which it may be obtained, from the remission of £1 per cwt. duty.

The new sources of revenue proposed by the Chancellor are :—A stamp duty of 1d. on contract notes; of 3d. on dock warrants; and of 1d. on cheques drawn by the payer himself, hitherto exempted; of 1d. upon certificates or copies of registers of births, deaths, and marriages; of 6d. upon transfer notes on mining shares under the cost-book system; heritable bonds to be charged with stamp duty; agreements, 6d. to 1s., according to length; building societies are no longer to be exempted from stamp duty; agreements or leases, 2s. 6d. and upwards. There is to be "charged upon chicory or any other vegetable matter applicable to the uses of chicory or coffee, grown in the United Kingdom, for every hundred weight, raw or kiln-dried, until the 1st of April, 1861, the duty of 3s., and on and after that date, 6s." This wording would admit foreign-grown chicory free, as it at present pays no duty, which can scarcely be intended, we should suppose, and would be a gross injustice to the British grower; although the quantity now raised here is small, only about 500 acres being devoted to the culture. The imports of foreign chicory in 1858 reached 127,553 cwt. Hence a 3s. duty would yield upwards of £19,000. Surely the foreign-grown and British should be placed upon the same footing; and when this article was selected as the first upon which to take the vote on Friday night, the preference given to foreign-grown seems somewhat strange.

The game certificates are to be modified; servants are to pay 27s. 6d., and the charge for the general certificate to sportsmen is to be graduated down from £3 to £1, according to the period of the year at which it is taken out. Only about 34,000 certificates are now taken out annually. Eatinghouses, or any room, shop, &c., where victuals or refreshments are sold to be consumed on the premises, are to pay a licence of 10s. or £1, according as the rental is above or below £25. This will include pastrycooks and confectioners as well. These may also be granted a licence for the sale of either beer or wine at £3 or £4 10s., if above or below a £25 rental, or at £5 or £8 respectively for the sale of both beer and wine. A registration fee of 1d. is to be charged on every package or separate article imported or exported. This is anticipated to yield £300,000.

In future, Mr. Gladstone informs us that the bulk of the Customs revenue will be derived substantially from fifteen articles. "There will be a relief from indirect taxation of about £4,000,000. Out of that, £1,000,000 paper duty will go directly to stimulate the demand for rural labour. £1,800,000, or the greater part of £2,000,000, under the French treaty, will in every instance strike at differential duties, and will be the means of removing from the tariff its greatest, perhaps its only remaining deformities. There will be on the British tariff, after the adoption of these changes, nothing whatever in the nature of protective or differential duties, unless you apply that name to the small charges which will be levied upon timber and corn, which amount in general, perhaps, to about 3 per cent. With that limited exception, you will have a final disappearance of all protective and differential duties, and the consumer will know that every shilling he pays will go to the revenue, and not to the domestic, as against the foreign producer. You will have a great extension and increase of trade, you will have a remission of the principal restraints upon travellers, and a great reduction in the expenses of the Customs and Excise departments. The immediate reduction in the Customs department will be £50,000, in the Excise £86,000; and the ultimate reduction upon the expenses of the departments I expect will be somewhere about £150,000."

We now come to speak of the French commercial treaty, and of the changes of duties contemplated thereby. And firstly, the concessions of France are very prospective instead of immediate. While we are to liberate forthwith almost all the articles shipped to this country by France, we are to receive no concessions until July, October, and December respectively this year; and for some we are put off till June next year.

France is very happy to take our raw materials of which she stands in need at once, but our manufactures, which are to compete with those of her own people, she puts off to a more convenient season, say next year. Our coal and coke she will admit on the 1st of July, at a duty of 15 centimes the 100 kilogrammes; iron and steel in October, and tools and machinery in December; but flax and hemp manufactures are deferred till June, 1861, and all other articles till October, 1861. Of coals we now ship to France about 1½ million tons, of iron and steel about 100,000 tons, machinery and tools to the value of £250,000.

The duties on our goods are hereafter not to exceed 30 per cent. *ad valorem*.

We may find increased vent for our linen and cotton yarns in France, but we shall also find them outbidding us for increased supplies of all the raw materials for the leading textile manufactures. Although the home consumption of linen is very great in France, yet they will soon be able to rival any country in Europe, and compete successfully in the markets of the world. The home consumption is estimated at fully seven yards for each person. The annual value of the finer yarns we at present ship to France is about £150,000. The imports of cotton last year into France were upwards of 3,000 tons beyond those of 1858. The number of factories in France is three times as large as in Great Britain, although they are less productive from the different proportions of machinery and moving power, and the absence of the bones and sinews of manufactures—coal and iron. But increased supplies of these from our own ports will greatly advance her progress as a manufacturing power, while she has cheaper labour also at command. Four or five years ago there were 13,000 factories in France devoted to textile manufactures, employing upwards of 707,000 persons.

And in what has been covenanted for us with France, we are to sacrifice the interests of all our manufactures, for we scarcely believe that we can compete in many of these with France, especially in silk and leather work. "We undertake to abolish immediately and totally all duties upon all manufactured goods. There will be a sweep, clear, certain, and absolute, of manufactured goods from the face of the British tariff."

The duty on foreign brandy is to be reduced from 15s. to 8s. 2d. a gallon, to the great consternation of the British brandy-distiller, who has worked up, of late years, a trade of one million gallons a year. Wine is to be reduced from 5s. 10d. to 3s. a gallon, and in April, 1861, to 2s., 1s. 6d., or 1s., according to strength. That the cheap introduction of some of the continental wines will be an improvement upon much of the so-called Cape wines sold, we are free to admit. Whether the production can be stimulated so as to meet an increased demand, or whether the British taste will again be led to indulge in these light wines to any great extent, remains to be seen.

There are numerous articles of French manufacture which will be greatly influenced by this new treaty, if carried into force. But on many we cannot now touch. The reduction of the duty on manufactured corks, gloves, and straw-plaiting is deferred till the 1st April. Of corks the quantity imported in 1858 was 452,365lbs., of which 295,483lbs. were taken for home consumption. The great bulk of these (409,000lbs.) came from France, and the remainder from Spain and Portugal. The duty on the raw material has been removed these five years past; and 6,000 or 7,000 tons of this bark are now brought in. Of gloves we already import about three-and-a-quarter million pair, almost entirely from France, at a duty ranging from 2s. 5d. to 4s. 8d. per dozen pairs.

The imports of straw-platting, &c., for the last two years have been on the average about 145,000 pounds weight, assessed chiefly at the duty of 2s. per pound, and a small quantity at 6d. per pound. The revenue brought in by this has been under £14,000. The more valuable kinds have come in from France and Tuscany; and the former sent us the largest proportion. But with the removal of the duty we have no doubt greatly increased imports will come in from Tuscany, that is, if fashion be directed in this line. Few persons probably have any conception of the great extent of this national industry in Tuscany, where it forms the chief article of export. The value of these exports in 1855, reached £23,186,672, of which £15,834,507 was hats, £7,158,060 plats, and £30,553 the raw material. The attempts made in other countries to produce this peculiar kind of straw have hitherto failed.

HOW MANY LITTERS WILL THE SOW PRODUCE IN A YEAR?

We have no domestic animal of value to equal the sow as a breeder: her fecundity is astonishing. "Instances are recorded of a sow which, in twenty litters, produced the extraordinary number of 355 pigs; as well as of another having farrowed thirty-seven at one birth, and from fifteen to twenty are not uncommon," but about half that number after the first litter is more usual. The general average of litters raised would vary from six to nine, and if more than nine are attempted there will generally be some weakly ones which cannot be profitably reared. The sow will readily breed twice in the year: her period of gestation is about 120 days. Occasionally she may produce three litters in one year, or five litters in two years. Taking these litters to average eight pigs each, she produces forty pigs in two years; but taking her progeny into account, and supposing her to produce ten breeding sows the first year and ten the second year, and, further, taking her to continue in this prolific course for six years, the time experience has determined that her breeding should terminate, what a vast progeny has proceeded from her in successive generations! How many in number I shall leave the curious to cast out; sufficient is it for my purpose to show with what amazing facility a breed of pigs may be propagated. I am aware that this is a very high estimate of the breeding capabilities of the sow. Let it suffice, then, that she breeds twice in the year, and that she rears eight pigs of each litter, which is not an extravagant estimate, it is in this way marvellous how soon a large herd of swine may be secured by making breeders of all the healthy and likely sows.

Let us try a statement of the case. The first litter to be half sows capable of breeding: this will be four. These at the age of fifteen months will each produce a litter, say of eight: the half these again at fifteen months each bring forth eight; thus we have sixteen young sows, producing eight each, besides those of the second and subsequent litters of the first sow, and the successive progeny of the four next in order; and this course being pursued, as I have said, till the first sow has done breeding at six years, and what an immense number would be propagated! the one-half (sows) being in continued course of breeding, the hog pigs being fattened off at about fifteen months each. Now, if I allow amply for casualties, I think it will be found that we have fattened off upwards of 70,000 pigs, which I shall estimate to weigh about 2 cwt. (of 16 stones) each, *i. e.*, 140,000 cwts. of pork at 50s. per cwt. £350,000, and we retain besides 70,000 breeding sows. I think, then, I am right in asserting, that no animal of the farm can at all compare with the sow as a breeder; for mark, all this immense produce may be made to come from one sow in the course of seven short years, and no animal can probably compare with her in respect to profit. (The sum total without casualties would reach 172,442 pigs.) My object in making this rather singular statement is to call more general attention to the breeding and management of pigs as the best means of providing a cheap, good, and economical food for a vastly increasing population. I again repeat, that something must be done to restore our agriculturists to their proper position in the country, of which the low price of grain has deprived them; and this, I venture to say, is one of the many schemes which may be adopted, the low price of grain itself being one of the inducements to enter upon it more extensively. I am not wild enough to imagine that every female of every litter is to be kept for purposes of breeding: this is by no means necessary; but it is necessary that more be kept, and of the best character too. 'Tis always best to breed from good stocks. The breed of pigs is on all hands surprisingly improved, so that it would now be absolute folly to breed from inferior herds. Prolific breeders, and quick growers and feeders should be universally sought for. Early maturity in a pig is as valuable in the sort as in any other animal, if not more so, as it is of great importance that they be kept progressing from the litter to the butchers' knife.

The pig is, of all animals, the least dainty; he will feed and thrive upon almost any kind of food, which makes him invaluable on most farms, as the refuse of every kind goes to "poor piggy's" share. He is to be found in every condition of life, from the poor man's sty to the nobleman's splendid piggery. Every one keeps the pig who can do so; every body consumes his flesh; and the great bulk of the labouring classes, the agricultural classes more particularly, eat very little other meat. It is highly prized by all classes, and the more there is provided at a cheap rate, the greater will be the consumption.

It is not my intention at this time to go into the subject of "the breeding and management of pigs," but at a fitting time shall have pleasure in doing so; my wish is, that many of my readers will kindly favour the public, through the pages of the *Mark Lane Express*, with any facts of prolific breeding, profitable management, early maturity, excessive weight in a specified time, or any other matter of interest relative to the pig, which may tend to make him more popular and of greater utility to the public than he now is. I think, also, that if our friends would give their views upon the best means to be adopted for extending the breeding and feeding, as also of the best management in every stage of their growth, it would be exceedingly useful.

We live in progressive times. The breeding and management of pigs has partaken of the onward movement. We require the best information on every point: What is the best time for the sow to bring forth her first litter? What length of time ought they to remain with the sow? At what age should the castrating and spaying take place? How long are the parts healing? What is the best age and the best time to effect the most profitable sale? At what age should the stores remaining be put up to fatten? What is the best and most economical food to give them? Which is the best time for feeding, and how frequently in the day? Which is the best kind of meat to make of them—pork or bacon? Should this depend upon the variety of pig fatted—*i. e.*, the large or small breed? or should it mainly depend upon the particular locality in which they are fed, the inhabitants of some districts consuming pork, others bacon, according to custom? Will they feed best separately, or with others in the sty? Will pulped roots and meal, or boiled roots and meal, fatten them most satisfactorily? Are any of the new quack foods of real value in fattening them? How long a time can the pig be profitably fattening? These and many other questions suggest themselves, which I trust my readers will kindly take up and answer as soon as possible. It is only in this way that progress of an extensive character can be made; and it is in the diffusion of such practical knowledge that attention is aroused, and the best courses of management are sought for and obtained. It is, I think, manifest, even from this short paper, that much remains to be done to provide for the wants of the community in the articles of pork and bacon, the most substantial and most common of our animal food. I again repeat, it is ours to provide a cheap and nutritious food for the country; and I venture to say that the cheapest and best for the bulk of the people is pork and bacon. I want to make it so plentiful that every family shall have enough, and at a rate satisfactory alike to the producer and consumer.

WILL THE SOIL GROW TWO CROPS AT ONCE?

In proposing the above question, I wish to guard my brother-farmers against the adoption of any Utopian scheme that may arise in their minds from any question I have asked, or any facts I have or may adduce. Farmers love to try experiments, new courses, and new plans; the nature of their business admits of it. "I shall try so-and-so this year; Mr. A. tried it last, and likes it very well," says one. "My crop of ——— did not answer last year; I don't try that again," says another. "Mr. B. has wheat every year; I shall try a little next year," says a third. "Mr. C. grows beans and carrots together profitably in alternate rows; *I* mean to try that," says a fourth. "Mr. D. grows peas and turnips in alternate rows, the turnips coming into perfection as the peas are removed; this plan *I* shall try," says a fifth. "Mr. E. grows beans and mangolds satisfactorily at the same time, also in alternate rows; this *I* think very good, and *I* mean to try this system," says a sixth. And thus continually are our good easy farmers led into unwary courses, often ending in great loss, dissatisfaction, and disappointment. These plans may be all right and proper under certain managements and circumstances; but it is not because Mr. A. succeeds that Mr. B. is equally certain of success. Mr. A. has studied the subject in theory, and has adopted the practice necessary to secure his crops, hence his success. Mr. B. must either do the same, or depend upon his neighbour Mr. A. for his aid and advice how to proceed and act under it, or he will fail. Nothing of this novel kind must be undertaken at haphazard. There must be careful preparation and a knowledge of what the soil and crop require, and how to supply it, before the thing should be undertaken. I by no means urge the adoption of any of the courses intimated by the questions I have asked in this and preceding papers. What is required is practical information, which I trust the readers of the *Mark Lane Express* will supply.

I will again give a few facts as to these double crops; at the same time I decline offering any opinion as to their utility or profit; they are plain and simple facts. Mr. Bravender, in the eleventh volume of the *Journal of the Royal Agricultural Society of England*, page 427, describes the course pursued with a double crop on Lord Bathurst's farm at Cirencester: "The beans (winter beans) were drilled in double rows, with an interval of three feet. In the spring the mangold was planted between the double rows in the centre of the wide space left. At harvest the wurzel was very regular, but not so large in bulb as those planted without beans; but on the beans being removed the wurzel grew very rapidly, and when removed for storing were *little inferior in weight to those where no beans had been planted*."

Mr. Chas. Hannam, in the R. A. S. Journal, vol. vii. page 589, gives the details of several crops of peas and turnips. The peas being drilled in rows 12 to the rod wide, and as soon as finally hoed the turnips are drilled in between the rows. In all cases he had good crops of turnips and satisfactory crops of peas. The peas were the early varieties.

Mr. John Thompson, in the R. A. S. Journal, vol. xii. part 2nd, page 581, gives an account of some double root crops, *i. e.*, crops of mangolds and carrots, drilled in alternate ridges of 24 inches apart. The result was, that in each case the yield of mangolds was greater than in the continuous rows, and the carrots produced eight tons per acre. Tried several times.

The Rev. Thos. Burroughs, in the R. A. S. Journal, vol. xiv. part 2nd, page 425, says: "My plan consists of having two rows of winter beans about seven inches apart, and these a yard interval, in the middle of which is a single row of turnips; the average produce of the former, during five years, has been a little over three quarters per acre; and the latter has been a full half-crop, with both bulbs and leaves of a large size. The soil silicious, commonly called red land. Occasionally cabbages or coleseed were substituted, the result not so good. The spring crops, as above, were put in after the beans had received their various and requisite horse hoeings, and other weedings, &c. Many other instances of this double cropping might be adduced from both published and private sources; but as the "Journals" are open to all, I have so far abided by them. One, however, I may be excused for giving, although of a somewhat private character. It is from the Rev. S. Smith, of Lois Weedon, a name well known in the agricultural world, and who is doing signal service to agriculture by pioneering in a course of culture peculiarly his own. By his system (a revival in a certain sense of Tull's alternate culture) he has succeeded in obtaining an annual average product of wheat, during thirteen years, of 35 bushels 2 pecks per acre from poor clay land, and that without an ounce of manure—a success worthy extensive imitation. Mr. Smith grows winter beans at the extravagant width of five feet apart in the rows, and with a thin seeding; they branch so thickly and widely as to meet across the intervals, and in ordinary seasons are podded from top to bottom. "It almost transcends belief that, in spite of such wide spaces of ground left unoccupied between the rows, the produce one year was seven qrs. per acre. But having witnessed the rows in June nearly touching across the intervals, and counting 35 to 55 pods on single stalks, we can readily acquiesce in the accuracy of the measure stated. Last year (1857) the yield was 50½ bushels, and the beans were a first-rate sample. In 1856 the produce was 38 bushels per acre. But the intervals are not wasted, for the beans ripen in time to admit an interlining root crop to perfect its bulbs; and from the same acre of land which produced the 50½ bushels of beans were taken eight or nine tons of red carrots, and the bean crop of 1856 yielding 38 bushels gave also a fine crop of about 14 tons of carrots."

In 1858 Mr. Smith writes:—"My winter beans, in single rows five feet apart, yield, by measurement, five qrs. to the acre, with an interlining light crop of carrots. By the expression, five qrs. *to the acre*, I mean, the whole superficial acre, including the fallow intervals." Mr. Smith also takes double root crops. His mangels are put-in in rows five feet apart, and the middle of the interval has a row of carrots: in this way he obtains 24 tons of red mangels and 16 tons of carrots, *i. e.*, 40 tons of roots. P. F.

SANDY LANDS OF SURREY.

Chalk is the geological base of the county of Surrey, of which deposit the central elevation occurs at Salisbury, sending branches in different directions. A large branch, called the North Downs, runs through the county of Surrey, and through Kent by Canterbury, forming, in the termination, the stupendous cliffs of Dover. Another branch ends in Beachy Head, forming the South Downs, and, along with the North Downs, enclosing the Weald district of Surrey, Kent, and Sussex. The northern declination of the North Downs dips beneath the London basin, being first covered by the plastic clay, which is overlapped by the London clay, and this covered near to the river by a fresh-water alluvium. On the southern side, the chalk is covered on the top and side by the plastic clay, which dips beneath the London clay that fills the valley. A low range of sand hills follows the chalk almost through its whole course, dividing the valley of London clay from the Wealden deposit, which occupies the country southwards from the rocks of sandstone. This deposit of rock overlies the oolite, and supports the chalk, being the third sandstone in the geological ascent. It is called the quartzy sandstone, from the composition, in particles, of white quartz cemented by a calcareous base, or united without any cement, and frequently contain scales of mica and imbedded grains, and portions of a green substance of the nature of chlorite or angite. The quartz particles are sometimes so arranged and connected that the sandstone is as massy and compact as quartz, while in other instances it occurs in the state of loose grains of sand. The following subordinate beds have been distinguished—lead-coloured clay, micaceous and sandy blackish clay, and iron sand. The rock frequently contains imbedded contemporaneous masses of chert; and the same mineral also occurs in beds, and sometimes the sand and chert are traversed by veins of chalcedony. Thin beds of coal are sometimes contained in it, but are of no value in an economical point of view.

This rock of sandstone is divided into the upper and lower beds by an intervening argillaceous deposit, called the "gault or golt" clay. The upper bed is called the green sand, from the abundance in it of the green silicate of iron; and the lower bed is called the iron sand, from the presence of the black oxide of iron. The upper green sand constitutes the malm rock or fire-stone of common use, green, grey, or white in colour, with nodules of chert. The gault clay abounds in shells, and affords a rich treat to the conchologist. The lower sand contains deposits of ochre and fuller's earth, with layers of chert, local beds of gault, and rocks of chalky or cherty limestone. The whole formation of sandstone is about 600 feet thick.

The stones of this rock are not very useful. The limestones are cherty, short in the breakage, and round in the clearage. The sandstones are of the same nature, and though used for building walls, the corners are done with bricks, as the stones do not receive any square form or shape. The cherty limestones of the upper bed, the sandstones of the lower bed, and the ragstone of Kent, are all of this particled nature, short and abrupt in the aggregation.

This sandstone deposit of rock is most regularly stratified, but the beds or laminæ are not so extensive as among the older formations. In the green sands, beds are rarely traceable, except where clay and limestones are intervened and introduce this structure among the sands. In other cases the layers of chert nodules, or thin chert beds, mark the successive stages of deposition. Where none of these causes exist, oblique laminations and concretionary geodes, and other arrangements of oxide of iron, render it almost vain to look for stratification. Still, the evidence is the clearest possible of regular deposition from water, and of a slow and quiet accumulation.

The third sandstone, either in the upper or lower beds, accompanies the chalk formation in its progress over England. In a long course it encircles the Wealds of Surrey, Kent, and Sussex, when the general character is attended with some local peculiarities of interest. The south side diminishes in interest, but the northern range is generally elevated and remarkably continuous by Reigate and Maidstone, to Folkstone and Hythe. At Leith Hill is a broad plateau: the rock is ferruginous at Reigate: at Nutfield are beds of fuller's-earth: from Maidstone to Folkstone the rock contains an abundance of green grains and nodules of whitish limestone, which is sometimes chalky and often cherty with green grains, and considerably rich in fossils. These beds are called Kentish ragstone, and much used in buildings, some stones being of a dark grey colour, very hard, full of green grains, rich in fossils, some of which are found in the upper green sand. The cherty beds of Leith Hill and Haslemere are probably the representatives of these calcareo-siliceous layers.

The widely spread and deep working denudation, which swept the deposit of chalk from off the whole Wealden formation over which it had extended, exposed the green sands at Reigate and westwards, exhibited the gault clay at Godstone, where it is called "black land," and showed the lowest bed on the iron sands at Limpsfield and Westerham, all being done in the eastern progress from the central elevation of chalk. The first decompositions of the rock, on parting with the chalk, form good lands, as at Farnham, being mixtures with sands and chalks; the further progress exhibits green sands at Reigate, mostly poor soils, and many altogether worthless; lower down, the gault clay is exposed at Godstone, forming a very untractable soil, and eastward the iron sand appears by Oxted, Limpsfield, and Westerham. Along this course, the land or clay fills the northern valley to the base of the chalk range; the Wealden clay overlaps the southern tail of the sandstones, and these bodies being mixed into the sands affords in some places modified soils of a fair quality. The northern side yields the better lands from the London clay. These lands occupy the sides of the rock at any openings which run across the deposit.

The estate of Titsey, belonging to W. Leveson Gower, Esq., stretches north to south across the intervening formations from the chalk into the Wealden clay. Batley Hill, on the top of the North Down range of chalk, is 880 feet above sea level: the southern top and the side of the chalk are covered by the plastic clay, of which a most viscous quality is seen on the farms of Pilgrim's Lodge and Tandridge Court, about a mile eastwards from the seat of the proprietor. The plastic deposit dips beneath the London bed of clay, which occupies the valley, and overlaps the tail of the sandstone rock which runs in a range of low hills parrallel to the chalk. At the upper south end of the village of Limpsfield, which stands on the north declension of the sandstone deposit, there is a conical hill of sand, that has been excavated to be used in mixing mortar, and exhibits the iron sandstone imbedded among the quartzy white sand, as a most distinct accompaniment. Black irony bands encircle the blocks, which are blackish in colour, and not large in size. The southern top of the plateau of the rocky range of sandstone affords a lead-coloured clay for bricks, and the cut of the descending road at Pain's-hill into the Wealden level exhibits the sandstone as a very cleanly stratified rock, with short beds and not extensive laminæ. The stone is quartzy whitish in colour, and short in the breakage—the last character attaches to every rock of this formation, in sand, limestone, and argillaceous schist. This rocky southern escarpment continues, with flattened interruptions, by Reigate and Maidstone. At the door of the inn in the village of Limpsfield there is placed a stone as a stepping height into horseback for the loiterers on market-days, which exhibits the encircling band of irony concretions, being a block of the iron sandstone of the locality. The northern slope of the sandstone dips beneath the London clay, the rocks jutting out in various places in flattish deposits, and with a crumbling frontage, resembling a clayey schist, as is seen on the road in the village of Limpsfield.

The chalk and the underlying sandstone having been removed by denudation, the oolite is found to be covered by the Wealden clay, and this last deposit is placed by geology as part of the oolitic system of deposits, and consequently should underlie the sandstone rock now being described. But below Pain's-hill, on the southern slope of the rock above mentioned, the tail of the sandstone is most evidently overlapped by the Wealden clay, forming above it a dry friable ground, much infested with ant hills, and weak in cultivation. That geology may be the most correct which reckons the Wealden clay to be a formation posterior to the denudations, and to have been deposited by an estuary reflux, the mixed agency of fresh and sea water being evident from the exuvial remains of sea and land that are found in the clay. East and west of Pain's-hill, the rock presents a rugged escarpment, partially covered with brushwood, the tail of the sandstone being constantly overlapped by the Wealden clay, which extends southwards to the sea with inflected interruptions.

All the sands of the southern counties are derived from this sandstone rock, or the green sand of English geology. The upper bed, or the green sand, is modified into the arenaceous beds of Cambridgeshire, Bedfordshire, and Wiltshire. The Shanklin sands of Sussex, the sands Burreldown in Hampshire, and in other places, show a descent from the parent type ; while the Bagshot sands, and those of Hampstead, Highgate, and Hornsey, though they must be referred to a much later geological era, are clearly of the same origin, marine in nature, quartzy, and barren.

The chalk marl forms good lands at the base of the North Down range, of which a good specimen may be seen in Titsey Park, near Limpsfield. It lies in a recaltrant angle of the Batley chalk hill, between an eastward covering of the very viscous plastic clay and a westward salient angle of the lowest hard chalk. The permanent grassy produce is prime in quality, being composed of the true grasses, or the very best gramineous plants, being produced by a very careful manuring of the surface in regular divisions and stated intervals, which never fails in banishing weeds and in substituting the best grasses. Few situations exhibit an equal quality and management of a park for the convenience of hay and animal pasturage. The buildings for horses and cows have much merit.

The green-sand lands of Farnham are well-known in the quality for hops, being mixtures of sand and chalky alluvium ; the yellow sands of Reigate are not worth any consideration ; a somewhat better quality reaches to Godstone, which shows the gault clay ; thence by Oxted, Limpsfield, and Westerham, the iron sands appear in the true quality, and chiefly around Limpsfield on the Titsey estate. The best lands on this deposit of sandstone scarcely reach a medium quality, yielding in some few places fair crops of wheat and roots. A very hurtful ferruginous quality attaches to all the soils from this formation ; a battered hardness succeeds every fall of rain, which in southern climes, being of a planetary nature, a condition is produced in the land that proves very adverse to vegetable life. The absence of exuvial remains and the siliceous base, create a barrenness of soil that would not be expected under the benign climate of South Britain. Chemistry has boasted of having found phosphoric acid in the green sand, and that cultivation might be thereby induced. But that discovery will hardly persuade to cultivate at Reigate or Bletchingly, or the green or iron sands in the true appearance.

The best sandy lands are cropped, under the most approved rotations, with roots, grains, and clovers. The burning, scorching, or iron sands are not capable of maturing grain crops except in the best modifications of the ground. The hot suns of spring or the early summer, as in May, exert a scorching effect on the iron constitution of the land, which completely checks or kills vegetation, and the barleys sown on turnip grounds often do not rise beyond the sheath of the blade, and in one to two feet high, are ripened by whitening, and are not worth being thrashed. The evil arises from exposing the soil to the scorching heats by spring operations, and the chief object must be to screen the land from exposure by the autumn-sown crops of rye and winter vetches, which cover the ground with foliage, and excludes the heats of the spring and early summer. Rye forms the only seed crop ; the quantity of straw is large, and produces manure for the clay grounds that prevail in the locality, and the grain equals barley in price, and far exceeds it in quantity. But on these very weak soils four green crops will be required to yield one seed crop, and consumed on the ground by sheep, which animals are most excellent farmers, and must be largely employed on all dry lands under benign climates. These sands are most peculiarly suited for bone manure, as are the granitic soils of Scotland, and all lands that are very nearly related to the parent rock. The siliceous grit is most pleasing to the bones as a manure. The crops may be—1, turnips, with artificial manures, and consumed on the ground by sheep that are folded regularly on the bared ground ; 2, Spring vetches, also consumed on the ground ; 3, Autumn rye, consumed on the land ; 4, turnips consumed on the land ; 5, rye, for a seed crop. Or—1, spring vetches fed ; 2, rye fed ; 3, turnip or rape fed ; 4, winter vetches fed ; 5, rape fed ; 6, rye seed crop. A crop of barley and of clovers may be introduced occasionally, but turnips must be the clearing crop, vetches the cooling and smothering crop, and rye the seed crop, as it is sown in autumn and gets the benefit of the winter's moisture. Perennial grasses are not adapted for these soils, which never can be formed into pasture ; constant sheep farming, as now described, is the only mode of use, and varies well with the soils of plastic and London clays that are joined in farms. These latter soils being very viscous and intractable are best used in grass, as are all lands that require more power in the cultivation than the strength of two horses. If the herbage be deficient, the land must be relaid with grasses, after thorough draining, fallowing with dung and lime. The subsequent pasturage must be upheld with ample top-dressings that are frequently repeated. J. D.

TOP-DRESSING FOR PASTURES.

Top-dressing of land means the laying on the surface of the ground of such substances as are known to increase the quantity of the vegetable produce from the soil. It may be very reasonably supposed that this mode of using fertilizing substances would precede the application of them under the soil, or mixed with it, as the effect of substances accidentally dropped on the ground would first attract observation, and would suggest the use of the acting materials in that way, and also the modes that were subsequently adopted. The very oldest writers on agriculture do not mention manures at all; and, although their successors notice the substances as being an essential part of cultivation, we are left in utter ignorance of what way the dung was applied to the land.

Since the date of the earliest records of modern agriculture, the mode of using manure by spreading it on the surface of the ground has always held a very prominent place; and even at the present day it forms the manner of using fertilizing substances that is imperatively directed by the nature of the substances, that are used, and not far from being sanctioned as the most beneficial mode by the results of practice and the investigations of science. Observation, both intuitive and practical, has ever acknowledged that all fertilizing substances which are reduced in particle and minute in coherence, are most economically used by being spread over the surface of the ground, as the distance between the elements is more reduced, and affords more opportunities for combinations and reciprocal affinities.

The materials that are more gross in nature and larger in bulk, require to be reduced by preparation, and mixed in opposite qualities, in order to attain a state of minute adherence. Experience has ever recorded the fact that the effect of substances used as manures, on the surface of the ground, is in a direct ratio with the minute or aggregated form in which they exist, and that they are efficacious or fail in effect according as they are reduced in particles or concreted into masses. All chemical combination is the result of electric attraction; and bodies unite according to the distances at which the power is exerted. It is a general law that the efficacy is in the inverse ratio of the affinity of aggregation; for this latter power holds together the homogeneous particles, and prevents their separating, and joining the parts of another body; and the greater the power is, the less efficacious must be the affinity of composition. Bodies combine from being in opposite electrical states; and decomposition, consequently, proceeds from the same electrical condition. This action cannot take place unless the substances be mixed in the most intimate manner; and it happens only between the ultimate particles of bodies, and at insensible distances. If the attraction of cohesion only happens, in which the bodies retain the qualities they possessed before they were joined, and can be separated by mechanical force, there will be wanting the combination that results from the uniting of the different substances, whether simple or compound, and incapable of being reduced mechanically, and of which the properties are often different from, and sometimes opposite to, its former constituents. This affinity of composition is one chief agent in the operations of Nature and of Art; and the ease and rapidity with which bodies are decomposed or enter into new combinations, are directly as the quantity of the surface which they present, or inversely as their masses. The efficacy of composition is inversely as the attraction of adhesion. The absolute force remains the same, but increases on account of the diminution of the opposing attraction. Electric attraction is the principle in action; and chemical affinity is the power by which bodies unite—the one being, in this sense, a measure of the other. All chemical forces are subordinate to the causes of life, and to heat and electricity, and to mechanical friction and motion. The latter power is able to change their direction, increase or diminish their tendency, and also completely to stop and reverse their action. Causes must exist to produce chemical affinity, or the cycle of life would stand still; and, from our ignorance of these causes and of the application, it is probable that in many cases their action is arrested and stopped, often rendered useless and not produced at all, or, at best, but accidentally. Bodies that have little or no affinity, and do not enter into combination, are made to do so by the addition of one or more substances; and this principle shows the necessity of applying a number of substances at one time, and of bringing them into contact with each other in a state of very minute adherence. Many kinds of chemical action are effected by heat, electricity, and other agencies, over which any control is impossible, and which do not take place from mere comminution and mixture; yet by that process a ready accession of means will be offered of producing combinations which, in another state of existence of the substances, would not have happened. Science shows that quantity is in many cases necessary to produce any combination whatever; for an increase of quantity is known to be equivalent to a superior affinity: and, though no rule has yet been obtained in respect of the quantities to be used in each particular case, yet the strongest presumption may be drawn in favour of the above conclusion being generally applicable.

The maxims of chemistry that have now been quoted are quite decisive in showing that all bodies from whose union and combination the benefits of new formations are expected, must be brought into contact in a state of comminution, and must be very intimately mixed, in order that the distance may be insensible between the molecules of the different bodies which produce the reciprocal action. Though one general principle produces the operation, it is very much influenced by various causes, as by the quantity of the bodies or substances, and by temperature in a great degree, by electricity, and by mechanical pressure, by unsolubility, and by other causes arising from peculiar circumstances. One body at least must be in a state produced by solution or by fusion. Water or some liquid is necessary to produce a heterogeneous affinity, and the union results from the reciprocal action of the molecules of the two bodies on each other. Different effects are accordingly produced on different objects in different situations, and the quantity and degree of the exertion of the power depend on various and changing circumstances; for bodies in a changing state, also change capacity. A knowledge of the phenomena of nature, shown in the order and mutual dependence of combinations, would enable us to make them subservient to the improvement of the arts, and direct them to the useful purposes of life. It may be very fairly questioned if agriculture has yet derived the full benefits of comminuition and a mixing of the soil with the substances that are used as fertilizers. Experience has ever shown that the superior effect of substances on the face of the ground arise from the finer state in which the materials exist, and that much of the benefit derived is owing to the attention that is bestowed on this point.

Nature has produced bodies in different forms and qualities, minute in bulk, diminutive, reduced in size, concreted and aggregate, and hard or soft, fusible or nitreous, harsh or sweet, acid, acrid, or corrosive. Some are more simple than others, or they are formed of fewer elementary substances, and are consequently capable of exercising a chemical action on all substances in contact, for all bodies of simple constituents have an aptitude to enter into combinations and to effect decompositions, and the results will depend on the strength of the respective actions. In making a change in the nature of bodies, fire and water are the two effective agents: the former banishes the existing qualities, and confers new properties; the latter by its insinuating power disintegrates the mass, and sunders the particles, and brings the elements into a fresh contact in an entirely different form. For the purpose of being used as manures, most bodies require to be altered in some way, by means of which the quality is brought nearer to the condition which is known to yield the desired purpose. Hardened or rocky substances are acted upon by five, and earthy matters are impregnated with liquids. Other similar ways are used to prepare the various matters that are known to form the useful substances. The materials of top dressing are in three divisions:

Section 1. Earthy bodies.
2. Animal matters.
3. Saline substances.

1. **Marl** occupies a prominent place among natural substances that do not require a preparation to be used as a top dressing for pasture lands. The word means "marrow, fat, or a preparation of the earth," and by the ancients it was called "terræ adeps," and was well known to them. It is a calcareous earth, or a carbonate of lime with portions of other earths, and assumes a fat unctuous appearance after crumbling or dissolution. Geology places it in the tertiary formation, resting upon the gypsum and alternating with it; the bed is white and calcareous, and contains silicified remains of trees, plants, and shells: other beds are argillaceous, and of great thickness, and often contain balls of celestine or sulphate of strontites. The uppermost beds are thin, and contain large quantities of oysters; marine shells abound in the beds that join with sands and sandstones, and the last bed is of the fresh-water denomination. Marls have been found stratified in some parts of Europe.

The component parts of marl are so very minutely blended as to be invisible to the naked eye; and from this circumstance, and from containing both salt and fresh-water organic remains, and from the fissile structure, it has been conjectured that marl has been produced by the detritus of other substances, and that the deposit has subsided from a liquid state. This supposition is strengthened by the circumstance of the substances occurring among the fletz, or secondary strata. They are soft and opaque, and miscible with water by agitation, soluble in acids with effervescence, harden in the fire, and vitrify with a strong heat; and to constitute true marls, the substances must contain as as much clay as to fall into a powder in water, and crumble into minute pieces by exposure to the air, and generally showing a heavy congelation, from the effects of the rays of the sun. The quantity of the calcareous matter varies from two-thirds to four-fifths, and may be separated by most of the acids, which will wholly dissolve the substance, and leave a residue of clay, which is composed, as usual, of alumina and silica. Marls are often found indurated, and form "Florence marble," and very like a compact limestone, and also schistose, as at Monte Bolca, in Italy. Earthy and hard marls are supposed to be produced by the decomposition of the latter, but the two kinds do not always accompany each other.

In agriculture the marls are called stony, sandy, clayey, and shell marl, according to the appearances it assumes in different situations where it is found at various depths under the ground. The first is usually called "rotten limestone"; it is slow and very lasting in operation, and very favourable to the production of grasses. "Sandy" marl is most frequent in Ireland, in the pits of limestone gravel, and is called limestone sand. It feels gritty, and moulders slowly; does not effervesce with acids, owing to the large quantity of sand in its composition; and on clay lands it has very much improved the texture of the soil, when liberally applied. "Clayey" marl is found in different colours—yellow, blue, red, and brown—occasioned by the substances to which it has been exposed, and by the subjacent and superincumbent formations. It contains more clay than other marls, generally from sixty to eighty per cent., and twenty to thirty-two of carbonate of lime, and eight to ten of sand, with some signs of iron; consequently it possesses a greater power of absorbing and retaining moisture, the feel is soft and unctuous, flexible like a paste, and dries and crumbles by exposure. The effects are very great in improving all light and thin soils, sands, gravels, and loams, as the clayey base adds to the staple of their soils, and produces consolidation. "Shell" marl is found in places that have been covered with water, and is supposed to have originated from testaceous animals, being composed of shells converted into calcareous earth, more or less refined and pure, according to the attrition and decomposition they have undergone during a long period of time, and according to the quantity and quality of the substances that are mixed with them by the deposition of the earthy and muddy matters left by the sediment of waters. This kind of marl contains more calcareous matter than the others, generally more than the ordinary limestones.

Most marls effervesce in acids when fresh; after burning, the ebullition ceases. But several varieties are used that show no affection by acids, and have long been celebrated as manures. Clay marl effervesces feebly, and hardens in the fire, while the more calcareous sorts dissolve in powder; and all marls are easily vitrified, and crumble by exposure, according to the solidity of the texture, and when burnt soon fall by the attraction of moisture, and feel greasy when they contain any particles of mica. Marls are generally found in a moist state, especially the argillaceous sort; they soon crumble by exposure, but lime is not altered. After calcination, lime falls into powder by means of air and moisture, but marl suffers no change.

The effervescence of calcareous substances in acids shows the presence of the article, not the quantity; the effervescence will vary according to the strength of the acid, and the compactness, penetrability, and other latent qualities of the calcareous bodies themselves.

Marl contains no salts, and the composition of it is very peculiar as a carbonate of lime.

A mixed marl has been found to contain, per cent.—

Fine sand	36
Clay of a soapy kind	44
Mould	5
Carbonate of lime	14
Gypsum	1
	100

The chalk marl in Norfolk contains, in 100 grains—

	Grains.
Chalk	85
Sand	10
Clay	5
	100

Clay marl in the same county, in 100 grains, contains—

	Grains.
Clay with some iron	50
Impure chalk	43
Sand	7
	100

A kind called "dove marl." from the similarity to pigeon-dung, contains as much as 98 per cent. of carbonate of lime.

Marls have been supposed to be derived from the ruins of the primary and secondary rocks, worn down, carried about, agitated, and deposited without any relation to the laws of specific gravity. Animal remains are found at considerable depths, and even stones of great weight are met with where no rocks of the same or a similar kind are known to exist in the surrounding locality or in the adjoining geological formations. Fire wholly changes the nature of bodies that are subjected to its violent influence, and gives them qualities they did not before possess, and banishes others which they never after recover. Decomposed lavas are exceedingly fruitful, and the heat of volcanoes produce a most luxuriant vegetation in all places within their reach; and it has been very fancifully conjectured that marl may retain some of the qualities which its constituent substances acquired as rocks by the igneous agency of their production. Such conjectures are amusing, but add nothing to the science or the systematized experience of any art, or to the use of any material.

For the sake of conciseness, marls may be divided into two kinds—shelly and earthy. Minute accuracy will make many subdivisions; but these two names will mark the distinction of having more earths or lime in the constitution of the substance. Shell marl is generally found under mosses, and at the bottom of lakes, soft and of a bluish-white colour, and seems to be a natural deposit where water has been stagnant. The composition usually partakes of the nature of the surrounding earths, and may properly be considered as a compost of organic matters with earths and calcareous materials reduced without the action of fire. It often occurs in ponds and land-locked bogs, on the sides of hills and the banks of river, formed by the accumulation and decomposition of small shells, as wilks and periwinkles, and also bivalves, and lying in beds of different thickness, running horizontally, but seldom of great extent. It has been found to contain 84 per cent. of pure lime.

Clayey marls are found below mosses, and in low wet places at the base of hills, and in the valleys between them. The composition of the quality varies much—from 15 to 40 per cent. of calcareous matter, and the remainder of clay and sand, with mixtures of sand, loam, clay, and chalk, according to the nature of the animal, vegetable, and earthy matters which abound in the locality, and which have been collected and decomposed together. Separate and distinct beds of clayey and sandy marls have been found alternating with clays and limestone, of which clay is the undermost stratum, the marl being of different colours, as it has been exposed to the elements composing and surrounding it, the redness showing the presence of iron, whiteness that of calx, the blue and yellow showing the clayey composition mixed with other substances. It is sometimes found very hard to dig, with lumps of chalk and limestone in it, lying under stiff clays and low black ground, and very compact and greasy—sometimes flaky, smooth, and red in colour, crumbling, and of a very good quality. Other kinds are slaty, and of the shape of flags, and of a bluish colour; are easily dissolved by the action of rains and frosts, and are of good quality.

Marls are well suited to be used as a manure in top-dressing grass lands, as the substance crumbles by exposure, and the particles are most minutely divided. The most preferable application consists in laying it on grass leys in the end of autumn or in the early winter, when the herbage will be of little value, and when the changes of weather will effect the decomposition of the marl by the time the grass shoots in the spring. It will thus secure an even spreading over the surface, and the bush harrow and the roll being afterwards employed, the particles will be well reduced, and pressed into the soil. The crop of grass is greatly improved; and if the land is ploughed for a grain crop in the following years, the marl will be thoroughly matted in the turf, and the vegetable sward which it it has raised will most materially promote by its decomposition the subsequent fertility of the land. This mode affords time for the crumbling of the marl, and it raises a close vegetable growth, on the decay of which the future crops of grass or grains depend for nutriment. The substance that is used for top-dressing cannot be incorporated with the soil from want of arable culture, and consequently the effects depend on the influence which it is able to exert on the materials with which it comes into contact. By raising a large quantity of grassy herbage in the shape of roots, leaves, and culms, it affords by the decomposition of these substances, when the land is ploughed, a vegetable "pabulum" to the growing crop, to which no manure yet known is superior, if any one be equal to it, either in power or durability. Consequently all top-dressing of an earthy nature should be used with the view of producing this growth for the benefit of future crops. The quantity of marls used in this way on grass lands may be stated at an average of forty to sixty cart-loads of two horses.

The use of marls on the fallows of barley and turnips, in the spring, admits of the better mixing with the soil, provided the suitable reduction of the marl be accomplished, which may be done by exposure, if the weather be favourable, before the last ploughing of the land, and when the nature of the marl itself favours the dissolution. It is often necessary to go over the work, and break the lumps of the marl with hand-mallets. The weather is the best operator; and the time of exposure may produce some useful reciprocal actions. In whatever manner marls are applied, it is most absolutely necessary that the substance be reduced as fine as possible, by breaking the lumps, spreading it evenly by harrowing and rolling when dried after rains, and by being ploughed into the ground by means of a shallow furrow. Some marls will crumble to powder immediately on exposure, or very soon after: others require the changes both of summer and winter, and also much attention in improving on the action of the weather, by breaking, harrowing, and rolling.

The effects of marl have been much the greatest on dry, heathy grounds, that have been converted into arable cultivation, and on sandy loams; and on all sandy lands, generally, the applications have been very beneficial. On raw, damp loams, reports have been unfavourable. The marl attracts moisture, and thus increases the poachy looseness of the land. Clays are much improved by large quantities of marl; but the clay must be well pulverized, in order to facilitate the incorporation with the marly substance. Practice directs the use of clayey marls on all light lands, and the application of sandy and shelly marls to heavier soils; but all these substances have been found useful on any soils, where judiciously applied.

Marls are often made into composts with earths and farmyard dung, either in layers in the heaps, or in the bottoms of the cattle-yards, where it will be soaked by the urinary fæces, and afterwards mixed with the mass. It is thought that such a preparation is more effectual than marl by itself. Frequency of marling may produce a hurtful looseness in the land, which is very easily removed by pasturing the land in rest for some years. The avaricious use of the plough has produced the trivial hurtful effects that have been observed from the use of marls.

The action of marls is usually attributed to the quantity of calcareous matter which they contain, and to the change that is made in the land by a mechanical action, and a mucilaginous matter that is derived from the exuviæ of animals. The extremely minute blending of the ingredients of marl has been supposed to constitute the fertilizing quality, each particle having the power of exerting its peculiar property on the soil and on each other, and of retaining or giving out the substances they may form, that are favourable to vegetation, by the different agencies and combinations. The clays impart moisture to the sandy parts, and the land prevents the clay from being too adhesive; and thus the respective qualities are exerted advantageously on each other. An oleaginous nature has been discovered in its composition, arising from the mixture of the substances with animal and vegetable matters; and to this property much of the fertility which it produces has been ascribed. It is also thought to be an absorbent earth, composed of clay and limestone, and that the useful quality is derived from the very ultimate mixture of these valuable ingredients.

The quantity of calcareous matter is no certain criterion either of the quality or effect of any substance. A mineral acid will show the presence of calcareous matter, but affords no directions either of the general quality of the substance as a fertilizer, or of the quantity that will be required to produce a result. The quantity of calcareous matter is no certain criterion either of the quality or the effect, for the marls that effervesce little or none by the application of an acid are good manures; and marls of great difference in colour, and in chemical composition, have been dug from the same pit, where they lay contiguous, and almost mixed with each other, and have shown no discernible difference of effect on any crop when applied in equal quantities on the same land. On coarse, heathy pastures, an application of marl produces the usual effect of calcareous matters, in banishing the rough faggage and substituting a close sward of finer grasses. This result will be obtained by the use of any substance, provided it be properly prepared for the intended purpose.

Marls exposed for years retain the same properties as when newly dug; do not effervesce after calcination; and good marls feel greasy when touched, and friable when dry. If the land is generally good in quality that lies on a bed of marl, the red and blue colours with yellow veins are found to be the best in quality. Marls are known by breaking into small pieces from exposure, by the crackling of the particles of dry marl, like salt, in the fire, and by throwing up bubbles to the surface of the water by which it is covered, and by gradually dissolving and forming with the water a soapy substance, like a paste, and not unfrequently of a liquid nature, the marl remaining dissolved and suspended in the water without any coagulation. But water alone will produce bubbles, when poured on certain dry clays —thence it is recommended to subject clays to water for a time before being tested by an acid. Marl contains no alkaline salt, as it imparts no quality, smell, or taste when digested or boiled, and has nothing that is soluble in water. Muriatic acid may be applied till the effervescence ceases; the loss of weight will show the quantity of air expelled, and the remainder is earth. The quantity of calcareous earths may be ascertained by dissolving the marl in muriatic acid, diluting the liquid with water, passing it through a filtering paper, and then precipitating the calcareous earths from the clear liquid by a solution from some fixed alkaline salts.

Marl is a heavy body, and being used in the crude state, it is not, like lime, lightened by incineration, and rendered more conveniently portable. It is, in consequence, only capable of being used in the vicinity of the localities where it is found, and where two journeys can be performed in a day. Reckoning on this inconvenience, the cost per acre of top-dressing cannot be stated below £4, and in most cases it will be above that figure. But, on the other hand, the advantages from the application are amply sufficient to repay that amount of expense, in raising a much increased herbage of sweet grasses, which lasts for several years; in very greatly improving the testimony of light sandy lands, by consolidating the materials; and by attracting moisture and by bringing forward on grass-lands, and maintaining, a thickly-matted quantity of grassy herbage to afford nutriment to the following crops by the future decomposition. On all grass-lands that are intended to be ploughed for crops, the top-dressing must be applied at least one year previous to the land being broken up, in order that the vegetable food may be provided by the effects of the marl on the surface. This point is very generally neglected.

It has been very plausibly conjectured that marls are a natural compost, formed of calcareous and other matters, and that the fertilizing property consists in the very minute blending of the particles, which almost escape detection by the microscope. This supposition very strongly confirms our earnest recommendation that all earthly composts be very finely pulverized, in order that the comminuted intermixture of the ingredients may yield the reciprocal action of the ultimate elements of matter. An idea gathered from nature not only strengthens and brightens experience, but advances the theory and ennobles the art.

No. II.—CHALK.

Chalk is a calcareous earth, and the most recent stratified formation of the carbonate of lime. It is divided into hard and soft chalk, and rests on the third sand-stone formation; it effervesces strongly with acids, and is distinguished from magnesia by not being disturbed by the caustic volatile alkali. Specific gravity 2.226, 2.252, 2.316, 2.657. Contains

Lime	56.5 or	53
Carbonic acid	43.0 or	42
Water	0.5 or	3
Alumina		2
	100.0	100

Hard chalk is burned into lime for building purposes; and soft chalks are used in top-dressing arable and grass lands, as clover leys, stubbles intended for wheat, and on bare summer fallows. It must be dug from the pits in autumn, and laid at once on the land that is to be dressed. The rains and frosts will be useful in pulverizing it, and what is left unreduced must be broken by means of axes and hammers. Some attention is required in getting chalk properly pulverized. The fat unctuous kinds soon crumble on exposure, but the harder sorts require longer time and much labour. The quantity laid on an acre varies much, according to local circumstances. A medium may be stated at 40 to 50 cart-loads, and from 8 to 15 loads of a waggon. The expense of carrying a crude heavy article very much restricts the use of the substance, and chalk in the original state falls under the list of these materials.

The use of chalk as a top-dressing is best obtained in the form of a compost with earths and peat, as is the case with all calcareous substances. It is a mild agent, and possesses no destructive solvent quality, which attaches to the lime-stones after undergoing the action of fire. In an unmixed state chalk absorbs moisture and attracts acids, which hasten putrefaction, and the mechanical action lies in uniting with clays, and forming a resemblance of marl, and preventing the hardness of the land in summer, and the wet adhesiveness in winter. On grass lands it has the usual property of a manure of any kind in banishing the coarser herbage, and bringing in the place of it the white clovers and grasses of a sweeter quality. Chalk has a very strong affinity for water, and consequently is most useful on dry lands and gravels, by attracting and retaining moisture for the use of the growing plants; and this use is very much assisted by being mixed with earths, and brought into contact with animal and vegetable remains in a state of minute subdivision, which settle downwards into a stratum around the roots of the plants, and form the source whence the nutriment is drawn and which was formed by the application. Hence arises the superiority of earthy substances for the purpose of top-dressing, over the effects of caustic stimulants. The latter exert a passing influence on the growing bodies of the moment, but leave no earthy residuum as a source of future use.

At a minimum calculation, the expense and dressing of unmixed chalk cannot be less than £4 per acre, or 40 cart-loads at 2s. each. This amount supposes a favourable contiguity of the chalk and of the land on which it is to be used. When made into composts the expense will be very similar, as the smaller number of cart-loads per acre will meet the cost of collecting the earths and turning over the heaps. In very many situations the cost will be considerably above £4, owing to the expense of carriage and the quantity of the article that is required to produce any effect. If this quantity be not large the expense will be wholly lost, for quantity is most imperatively required, in many cases, to rise into a superior affinity. The most important recommendation must not be omitted—that all aggregate bodies that are used in top-dressing must be reduced to a finely-pulverized state. Lumps of chalk will lie on the surface of lands without being broken; the plough and the harrow turn them over, and the roll presses them into the ground; but the purpose will be entirely defeated unless the body is finely reduced. Well-prepared composts have an advantage in this way.

On soils of the lighter description—sands, loams, gravels, and even on chalky lands—very great improvements have been done by large applications of chalk; the effects of which have not ceased with a few crops, but have operated, like all calcareous substances, in imparting properties to the land that it did not before possess, and at the same time increasing the quantity of every crop. The quantity applied must be large, both on arable and grass lands; on the latter an earthy compost is preferable, and largely increases the bulk of herbage, which by its decomposition affords the most valuable food of subsequent crops. In a state of grass the value lasts for many years, in a full third of increase. The great value of earthy top-dressings consists in the vegetable stratum that is formed by the roots of the plants along with the residuum of the manure.

No. III.—Clay and Lime.

Clay is a mixed body, mostly composed of alumina, sulphuric acid, and water. It is found in vast beds in the alluvial deposit of the tertiary formation, of which chalk, or the most recent condition of lime, forms the basis, and is much mixed with other bodies in different states and combinations. The prevailing colour is brown or reddish brown, yellow, and sometimes bluish; sandy, gravelly, often solid, more or less unctuous, and soft to the touch, often friable and dry, breaking into small lumps, containing more silex, and loses its plasticity; and perhaps no body is found in a greater diversity of composition, in soils and in slates, and in all argillaceous formations. It enters into all good lands—in fertile soils from 9 to 15 per cent., and in barren lands from 20 to 40 per cent. The absence of it forms a soil too dry and porous, and a superabundance of it constitutes a soil too wet and cold when in a moist state, and contracts and hardens by heat into a condition adverse to vegetable life. Clay is found calcareous, meagre, and unctuous, effervescing with acids, rough and gritty, and containing a greater quantity of alumina. The purest specimen contains upwards of 60 per cent. of sand, and is always mixed with mineral, animal, and vegetable substances. The aluminous base imbibes 15 times its own weight of water without dripping, and retains it with great obstinacy.

Like other substances, the quality of the clay, the mode of its combination with other substances, and the exposure of the combined elements, render it a fertilizer, both in the simple state, and in the condition of a compost with other substances. When found of a clammy or indurated texture, great difficulty is experienced in reducing the substance to particles that can act with and upon the other elements with which the contact will occur. But with calcareous clays, the process is easy. The mass is friable and crumbling, and the dissolution is so fine as to allow an intimate incorporation with the soil. Accordingly very great improvements have been effected by excavating clays of this nature, and laying large quantities of it on the surface of light lands. A moist quality has been conferred on the sandy soil, and more firmness, and a greater consistency. The quantity must be liberal—from 100 to 160 cart loads to an acre—and must be attentively used in the breaking and spreading of the pieces. On the other hand, ferruginous clays, and those of a white sandy and gravelly nature, are positively pernicious, and require to be mixed with substances of a better quality, to correct the noxious property, and also an exposure to atmospheric action, to extract and dissipate the hurtful effluvia. A total alteration must be acted upon the constituents before clays of that nature can be made fertile, either as a cultivated soil, or as an application to other lands.

Sulphuric acid in any form or combination is noxious to vegetable life, and in preparing clay for the purpose of acting as a manure, that hurtful ingredient must be banished, and more friendly qualities introduced. The quantity of acid and water amounts to two-third parts of the constituents of pure clay, and being in combination, the destruction of both elements must be effected. Some body must be applied that will act violently and forcibly in disintegrating the mass of clay, in sundering the particles, in banishing the existing properties, and in conferring more valuable qualities by means of reciprocal action and mutual combinations. For this purpose no better agent has yet been found than caustic lime, in a state of hot cinders newly burned. Lime is the oxide of calcium, one of the newly discovered terrigenous metals, which contains in 100 parts about 38 of oxygen. An oxide is a sour pungent body, which draws off every volatile substance without fusing the primitive body; it is the circumstance or state of change, while calcination is the mode of effecting it. By the application of a violent heat, lime loses the water of crystallization, and the carbonic acid gas is expelled, which in combination with the earthy base formed the neutral salt known by the name of carbonate of lime. In the newly-burnt state, it forms a strong caustic, and has a very powerful corrosive quality, and the alkaline character of turning vegetable blues into green. After being exposed to the air for a determinate time, it imbibes carbonic acid gas from the atmosphere, and becomes mild like pounded limestone.

Lime is a homogenous body, and will exercise a chemical action on all substances in contact; for all bodies of simple constituents have an aptitude to enter into combinations, and to effect decomposition, and the results will depend on the strength of the respective actions. The clammy and indurated clays, which are the most abundant, must be laid in an oblong heap of about six feet deep in the centre, and sloping at the ends, which will permit the carts to pass and lay the loads of lime upon the surface. The lime must be in the hottest possible state, and the clay may be in any form, dug from the beds of deep deposit, or from the surface ground of soil in mixture, and consequently with a portion of animal and vegetable matters. The heap of clay must be turned over, and mixed regularly with the cinders of lime, in the proportion of two to three, and the sides of the heap sloping all round, in order to allow room for the swelling of the mass. When moisture touches lime in a newly calcined state, a hissing noise takes place, a swelling follows, vapour arises, much heat is evolved, and light is emitted in dark situations. In most cases, the water that is contained in the clay will dissolve the lime, if sufficient care be used in mixing the heap that the lime does not lie in dry masses, but is touched by the clay in every cinder of its form. The heat that is evolved penetrates the harsh mass of the clay, and the acid and the water are expelled by its action, and are dissipated along with the water of the lime, which escapes in the form of a vapour. The aluminous base of clay, being thus freed of the acid and the water which rendered it harsh and rigid, immediately assumes a mild gelatinous form; and being united with the lime, which is now mild by the absorption of carbonic acid gas, the combination becomes a saponaceous mass of an unctuous nature, which is loosely connected, and easy of decomposition. The harsh properties of both the constituent bodies have been expelled by mutual action, and milder qualities have succeeded.

After the dissolution of the lime-cinders has been completely effected, and no more heaving of the mass takes place from the swelling of the lime in bulk, a time may be allowed to remain in quietness, for the purpose of settling the combination after the union has been effected by the violent intestinal motions that have been provoked by the action of the bodies singly and on each other. After remaining in a quiescent state for an indefinite time, the heap must be again turned over, and the materials very intimately mixed by breaking the lumps, and placing in the centre of the mass the substances that have been exposed on the outside, and consequently will be less decomposed. This movement of the heap will provoke new affinities, produce fresh combinations, and effect additional results. It must be done with much care in reducing the materials to fine particles in order to bring the bodies into contact in the nearest possible ultimate form, and at insensible distances. Unless these conditions be effected, no useful combinations will happen.

It will depend on the state of reduction which the mass of materials exhibits, if it be necessary to turn over the heap for the third time: if it be finely pulverized the necessity will not exist, after the heap is seen to assume the form of a saponaceous unctuousness; for the beginning of this condition shows that the affinities are exhausted, and that the results of their action are settling into the newly produced state of existence. But if the materials still appear to be crude and harsh, and if the lime still exists in the dry granulated form as it falls from the dissolved cinder, the heap may again be turned over with advantage. The lime is still hot, and will emit caloric, which will enter into and separate the bodies, sunder the particles, diminish the attraction for each other, and proportionally augment the attraction of the particles of adjacent bodies, and consequently produce combinations and facilitate reciprocal unions. This principle shows the necessity and advantage of the frequent stirring of mixed bodies.

Mixtures of lime with earthy bodies will require two or three turnings, according to the original state of the materials—if they be coarse and lumpy, or fine and easy of reduction. After every motion has ceased by reason of the non-generation of heat, the materials will become a saponaceous unctuous mass, and will afford a mucilaginous manure, which is easily decomposed, and applicable to any purpose of fertilization. The period of time of one year, at least, is required to produce a mass of mild and easily soluble materials from the agency of caustics on the crude and harsh earthy forms that contain both volatile and fixed principles of very inveterate hostility. When the mixing of the different bodies is done in summer, the compost will be ready for application in the autumn of the next year, after the hay crop is got, or on pastures somewhat later in the season, when the cattle are housed. An equally good season occurs in the early spring, before the grasses begin to rise; but the period of autumn may be preferable in the compost affording shelter during winter to the grassy herbage, and producing an earthy bed for the spreading of the fibrous roots. In laying composts over grass lands of old or young duration, carts with broad wheels must be used, with a tire of at least five inches in width. The compost must be spread from the carts by two persons provided with shovels, one on each side, to the right and left, over a space of ground in three yards of width to each person. When the earthy mass is laid on the ground in heaps, and afterwards spread, the bottoms are difficult to be cleaned out, and a tuft of herbage grows from the extra quantity of manure that is left on the spot. By spreading the compost from the carts a superior evenness is obtained, and the work is finished at once.

After the compost has been laid on the surface of the ground, in order to expose the cloddy particles to the action of the atmospheric changes, the bush-harrow will be very usefully applied in breaking into small pieces the lumps which will be formed, and in tending to distribute the mass equally over the ground. For this purpose, the harrowing must be done across and lengthwise, so as to act in both directions. When the surface has become thoroughly dry, a heavy roll must be applied, which will level all inequalities, and press together the earthy compost and the roots of the plants. The roll must be very liberally used both in the autumn and in the spring: one, or even two, applications may not be sufficient to produce a close bed for the roots of the plants in contact with the manure, and also level, against the penetration of drought.

The quantity of such a compost manure to be used on an acre may be stated at the average of 40 one-horse-cart-loads, and at the cost of 2s. per load, or £4 per acre. Very much of the effect of all manures is lost from want of quantity: the chemical combination of bodies is often produced by the addition of one or more substances, which alter the mutual relationship; and in changing state, they also change capacity. Different effects are often produced in different situations; and the quantity and degree of the exertion of the power depend on various changing circumstances. Besides the quantity and quality of the substances, much influence is exerted by temperature, by electricity, and by mechanical pressure, by insolubility, and by other causes arising from peculiar circumstances.

The compost manure that has now been described, being a cool mass, will be best used in cool weather, when the solubility will not be too much hastened by violent heats, nor be retarded by the pinching colds. A gradual decomposition will best answer the purpose of the assimilation of the elements to the condition of the food of plants.

The value is very great of earthy composts prepared in this way, for being used as top-dressings on grass-lands of all kinds, and also on fallow lands. Not only the common herbage is increased in one-third of the average produce, but the quality is very much improved by the invariable result of grass-plants of a better kind being brought forward, and established on the ground. It is a very beneficial practice to sow the seeds of the better grasses on the top of a liberal application of a rich earthy compost, to harrow the surface, and then to press the seeds firmly into the ground by means of a heavy roll. Inferior grass-lands are very much improved in this way, and at a very moderate cost in the purchase of the lime and the price of the grass-seeds. In every case of application, the compost of lime and earth is much superior in effect to lime by itself, especially on lands of an inferior quality. This fact has been settled beyond all dispute, and arises from the earth of the compost imbibing and retaining the caloric imparted by the lime, by which the future crops are more benefited than by the weak soil that is devoid of the quality of using caloric. Lime, in any condition, only raises the temperature of the ground in the form of benefit from its use.

The burning of clay for the purpose of being converted into a manure has been often tried with much vaunting confidence. By the application of a smothering fire the earths are divided and reduced into very fine particles, and invested with an unknown property, which substances acquire that have undergone the action of fire. In this state it is supposed to attract and retain ammonia, that is conveyed to the soil by rain-water, and thus affords to plants the nitrogen contained in the ammonia or volatile alkali. Clay is the oxide of "aluminum," one of the newly discovered terrigenous metals, and is composed of silica, alumina, oxide of iron, and some little inflammable matter; and probably some other substances, but in a very minute ratio. The combination of alumina with the oxide of iron produces the well-known earthy smell of clays. An oxide is heavier than the primitive body, by reason of the quantity of oxygen which has been absorbed. The action of fire on clay will oxidize the residual calces that compose it, and must contain none of the elements of vegetation—a property which belongs to all bodies that exist in that state. Very much, if not the whole, value will consist in the composition of the clay itself; and when it is taken from the surface of the ground will contain both animal and vegetable matters, and the ashes will be of the usual nature after burning. The practice of burning clay by itself has wholly sunk in repute, as it never had any legitimate existence on scientific grounds. A metallic base that has been divested of every other ingredient can form no fertilizing substance, and the preparation adds very considerably to the lessening of its value. On the other hand, alumina has a very strong affinity for lime, and hence the very beneficial results that attend the reciprocal action, and which arise from the union of the combination.

On the subject of using clay it may be added, that the clods of clay-land fallows may be very advantageously pulverized by being laid in heaps, and mixed with the cinders of hot lime, and which are dissolved by exposure, or by the application of water. The damp heat evolved by the lime will produce a smothering effect on the clay, penetrate the viscid mass, and impart a fertilizing property to the mixed substances. The lime and the clay will be pulverized together, and most minutely blended, and mixed in a manner that is otherwise impossible. This mode of using clay has been seldom noticed; but of the value of the application no doubt can be entertained.

Clay has been laid on longitudinal heaps of hot dissolving lime, and it is benefited by the penetration of the damp vapours from the bursting of the cinders; it is afterwards removed, and used as a manure. Little, certainly, is known of this method of using lime. The quantity of lime must be very considerable, in order to pierce and crumble a tough mass by means of damp exhalations. The duration may be doubted of the fertilizing quality that is communicated to the clay by the volatile elements of the caustic lime.

In mixing clays with lime, in order to form the compost as now recommended, the special attention must be directed to the placing the clay and lime together in the hottest possible state after the lime has been burned. The dissolution of the cinders by the effect of moisture evolves much heat, which penetrates and crumbles the tough harshness of the aluminous mass, and reduces it to the condition of being combined in a milder and more useful form. If the lime be allowed to lie exposed, and becomes mild, it loses the character of a caustic solvent, and assumes the state of an earthy ingredient. In this form, it does not act on other bodies, and enters only into a mechanical mixture with substances that are pulverized in a similar state. The clay is usually in the form of clods and lumps, and requires a powerful solvent, in order to disintegrate the mass and sunder the particles. If this reduction be not effected, the lime merely adheres to the outside of the clods: no combinations are effected, and no results are produced by the union of the different bodies. It is an object of the very last importance that the ultimate elements of bodies are brought into contact at insensible distances. The surface of one body being presented to the aggregated mass of another substance, affords no opportunity of reciprocal action: the distance is much too great; and the efficacy of combination is in the inverse ratio of the affinity of aggregation; and the greater the latter power is, the less efficacious will be the power of composition. Hence pulverized lime, being brought into contact with lumps of clay, can exert no useful influence, and merely gilds the clods with a whiter varnish than they before possessed. This principle is equally applicable to the use of lime on rough clay fallows. The lime is in fine particles, and the land in large pieces; and, consequently, no reciprocal action can happen. The lime is powerless from want of opportunity, and the soil is formed into masses which admit no influence of exterior action. Hence it would answer a very beneficial purpose to form heaps of the clods of clay fallows, mixed with lime-cinders, which, by bursting and evolving much heat, would penetrate, crumble, and pulverize the clayey lumps, and reduce them to ashes, and mix with the granulated particles of the lime in the most extreme comminution. Peat may also be reduced to ashes by the hot cinders of lime; and during the process, some useful combinations may happen between the lime, the clay, and the moss. Bodies that undergo, in conjunction, the powerful influence of fire, will have a better opportunity of forming new states of existence, than when brought into contact after the action has ceased, and the mutual change of condition has taken place. The susceptibility is cooled by exposure, and the homogeneous qualities are quickly lost, which enable bodies to attract each other, and to enter into combinations. Fire is a most violent agent; and the result of its action must be applied immediately on being produced, and before the nature is altered and neutralized by the introduction of adventitious elements. In the case of using lime and clay in conjunction, the quick use of the lime in the hot, caustic state, is the primary consideration, forming the useful compost by mixing the two substances.

A compost manure of clay and lime is very generally accessible to the farmer; and the results of its action as a top-dressing on grass-lands, and as a manure on arable grounds, are certain and durable almost beyond any other substance that is used, in the first case of application. Composts of lime and earth are very superior in effect to lime itself, on inferior soils; and on grass-lands, the duration exceeds any other top-dressing. The two properties—general accessibility, certainty and duration of effect—constitute a very powerful recommendation of use.

ON FARM IMPLEMENTS.

Harrows

Are best in the rhomboidal form, or a disjointed square, which lie flattest on the ground, and proceed most steadily. Clay lands may require drag harrows of iron, which are heavy for the purpose, and a gang of light grass-seed harrows may be added.

Rolls

Are most approved in a cast-iron cylinder of six feet in length and three feet in diameter, weighing about one ton. This implement most effectually crushes all turnip soils that are in fallow, also clay lands by repetition, and levels meadows and grass lands. A weight of six cwt. may be added for rolling potato drills and other light purposes.

Our experience adds only one tool to the three implements that have been now mentioned—a turnip-drill scuffler, and to earth up the ridges of potatoes.

Of the several searifiers that have been invented and used for the purpose of working the intervals of green-crop drills, our practice with most of them gives the preference to two skeleton ploughs joined together by diagonal bars over the beams, and set at the distance of the width of the drill. The implement is drawn by two horses, and directed by a man. The small mould-boards lay a furrow from both sides of the drill into the intervals, leaving the row of turnips standing on a narrow ridglet that admits an easy process of being thinned and set in single plants. The narrow point of the share pierces the ground and ploughs the interval, and effectually removes the weeds from the growing turnips. This is a cheap implement, simple in the construction, and easily repaired and replaced.

A Scarifier

Follows, that is provided with a front share which moves the bottom of the interval, and having two hind curved knives attached laterally for cutting the sides of the drill from the bottom to the side of the turnips. This implement, drawn by one horse, performs the summer work of fallowing the intervals, after being ploughed and moved by the skeleton ploughs in the twin formation. The curved knives are removable; and two mould-boards are fixed to the breast of the plough, when the implement is used for earthing up the drills of potatoes, with a heavy furrow raised by two horses, and once or twice done, as may be wished. This tool is cheap and simple, and answers two purposes.

A machine for sowing grass seeds in broadcast, is an indispensable tool on farms of any extent. A horse, man, and lad will sow 40 acres in a day of 10 hours, and in a manner very superior to any hand-sowing. Peas are well sown by this machine, which is cheap, to answer the objection of performing only one purpose.

A double-drill sowing machine for turnip-seeds is required on turnip farms, which is cheap and easily maintained.

With the tools now mentioned, any cultivation of land may be accomplished; and our estimate agrees with the Earl of Leicester.

Reaping Machines

May never become established implements of the farm; and, with all the ingenuity that has been employed, and may be called into action, the reaping of grain crops may ever remain a hand operation, at least in the greater ratio. Machinery requires certain provisions for its use. The steam-engine requires a level surface of iron rails; and wheels require a flat surface on which to run. Reaping machines require a crop of reedy, unbroken stems of a certain height, standing upright, not bent in any direction; and a level surface of ground. These demands are too many, except for some few situations, as in South Britain, of which the climate is early, and the winds moderate. The implement may be used in the north of England and south of Scotland, in the early season of harvest, and on some certain grounds and crops; but the general use never can be obtained, as many crops of grain are laid by rains, twisted by winds, and sunk by their own weight; and any reaping by machine is wholly beyond the question.

The machines are costly, complicated, easily deranged, and repaired with difficulty. Where the use can be admitted, an extent of ground is required, to allow the saving of labour to stand in account against the interest and prime cost. In small occupations, the cost of the tool and the limited use set aside the entertainment of reaping grain crops in that way. The scythe and hand-sickle are cheap in value, easily wrought, and replaced with small outlay. Reaping machines stand idle, except for a short time of the year, expend much capital, and have little opportunity of repaying it.

Steam

May never perform the detail work of the farm—its locomotive powers are beyond daily use, and then transported to other places and purposes. The stationary use in thrashing grain is quite another thing. In that application, every farm above 200 acres should have a power of 6 to 10-horse, for thrashing the grain crops, provided by the land-owner as a permanent article, and upheld by the farmer for this temporary use. If the land be ploughed by steam, the apparatus is too costly, and too cumbersome and dependent on contingencies; and only one purpose is effected. The steam-powers for thrashing can be applied to cut turnips into slices, and to cut all straws for litter into short lengths. In this way the use enjoys the opportunity of repaying capital with interest. Even with thrashing machines, an extent of occupation is required in order to justify the original outlay, and the constant preparation of fuel and other articles. In small occupations, horses will yet be the moving power, as the animals are on the farm, and do not incur any additional outlay in the use.

It is the grand aim of every active business to produce a result with the least possible cost; to expend a greater cost, with a prospect of a proportionate return; and to make a very large expenditure, upon a rational calculation of a corresponding increase. In every case, the secret lies between the outgoings and incoming—in the balance of payments and receipts. A certain amount of means is required to produce a result; and upon the provision and adjustment of these means the affair depends for the profitable execution. An implement to perform one purpose, and if that purpose is limited, is a useless expenditure of money: it stands idle in the shed, paying neither interest nor capital. All tools cannot be varied in the purpose, but as much as possible. A horse standing in the stable does not repay cost and keep; an implement in the cart-shed sinks into idleness the moving power of capital. A tool of one use must have an extent of application, in which it can work the just contribution. A reaping machine at £40 must have a large extent, and also the number of favourable circumstances: without these adjuncts, the effect must fail; and in small occupations the use will not be obtained.

All such cases as the present consideration are to be determined by first principles, as the whole value hinges on some single point. The multitudinous variety of farm implements that is now exhibited, only serves to confound the choice and perplex the judgment. Minute differences spend much time in the examination; and a formidable array of screws, bolts, and nuts serves loiterers with an excuse for adjusting. Agriculture is a simple performance. Its principles are obvious, and of the first occurrence; and its implements must be corresponding.

An expensive article must have a range of utility, in order to allow the performances to repay capital with interest; or it must be applied to more than one purpose, that from each may be drawn a portion of the repayment. A tool of one purpose must be cheap, that the single performance makes repayment.

On those points the judgment of the farmer must be exercised—his prudence and economy. His capital must not lie dead in the shed of implements, which, being inanimate, do not possess the power of procreation, but must be continually employed to supply the place of increase. Use comes into the place of fecundity, which is a chief point in the animal creation. As well keep animals that do not procreate, as idle implements, or that are but little employed. Much unnecessary expense, labour, and show are occasioned from want of this primary consideration. The principle must be established, not singly, but combined, and the details performed in a just comparison.

A sound economy is a sound understanding brought into action. It is calculation realized: it is the doctrine of proportion reduced into practice: it is foreseeing contingencies, and providing against them: it is expecting contingencies, and being prepared for them.

THE MANUFACTURE AND CONSUMPTION OF STARCH.

There are some industries of the extent and importance of which we have but a very vague idea. Amongst these have hitherto been the manufacture and consumption of starch, in the broadest or chemical sense of the term, not limiting it to the more ordinary public acceptation of the product for laundry and stiffening purposes. It is only when such subjects are occasionally taken up by scientific societies or public bodies as the text for discussion, that the various statistics and details of origin, sources of supply, processes of manufacture, cost, growth, demand, and various applications, are gradually elicited and developed, and much hidden trade information is thus brought to light. We have an instance of this in a paper delivered a few weeks ago, before the members of the Society of Arts, "On Starches, the Purposes to which they are Applied, and Improvements in their Manufacture," by Dr. F. Crace-Calvert, of Manchester.

Since the abolition of the duty on starch in 1833, a very great impetus has been given to its manufacture for commercial purposes; and various roots and grains have been laid under contribution to supply the immense quantity consumed, both in domestic as well as manufacturing circles. Calico printing, in its present extraordinary development, requires thousands of tons yearly of soluble materials for stiffening them, and for thickening the mordants and colours used. Formerly, until it became insufficient as a supply and too expensive, gum arabic was largely used. But now a great variety of artificial gums, or "gum substitutes" as they are termed, are prepared from potato and wheat flour and sago.

About ten years ago the quantity of starch made was estimated at about 20,000 tons per annum; but the manufacture has necessarily progressed with the increased production of cotton goods and the advance of population. And, moreover, this estimate did not have regard to the chemical starches, if we may so term the dextrines or British gums. These are farinas heated to a temperature of 250 to 300 degrees, which are thus rendered soluble as a gum, and come into extensive use for adhesive labels of every kind, whether they be goods, labels, postage or receipt stamps, or envelopes.

When we find that one single print works in Manchester uses above 300 tons of these products annually, the consumption in the kingdom must be fully 5,000 to 6,000 tons per annum. We are certainly within the mark in estimating the trade value of the whole starch manufacture of the United Kingdom at over £600,000. But to this we have to add the value of the starches and like substances imported from abroad, which amount to upwards of £300,000 more. With these large demands for starch here, the manufacturers necessarily sought for the most abundant, cheap, and productive material. In the United States they resort to Indian corn flour, maize being the great cereal staple. Here we fall back upon wheat flour, rice, or potato flour, according to the supply, price, and purpose. The progress of colonization and of experimental inquiry will, we doubt not, ere long, relieve us from the necessity of trenching upon food products for a starch material intended to be applied merely in manufactures. Attention only requires to be more prominently directed to this point. As Dr. Calvert observed, it was a great pity that staple articles of human food should be transformed and decomposed in order to get from them some 20 per cent. of this commodity of starch; whilst in other parts of the world things were produced in great abundance which, with the employment of a little capital and labour, might form an important branch of this manufacture. It would be a great boon to society if thousands of tons of food were now thrown on to the markets, and their value cheapened to the consumer.

Although we equally deprecate the extensive use of the cereals and edible root-plants for the production of starch for the use of our manufacturers, yet, if the demand must be thus supplied, our agriculturists might find it to their interest to raise, by the application of suitable fertilizers, wheat specially adapted for the starch-maker, by lessening the proportion of gluten and increasing the quantity of starch in it. The hard wheats contain a much smaller proportion of starch than the soft wheats. Davy states that spring-sown wheat yields 70 per cent. of starch, and autumn-sown wheat 77 per cent. The proportions given by Dr. Calvert show 56½ per cent. in hard Russian wheat, 62 in soft, and from 73 to 75½ in ordinary English flours. In potatoes the proportion is from 13 to 15 per cent. of starch.

Mr. P. L. Simmonds, who is looked upon as an important authority upon all these matters of commercial products and manufactures, took a leading part in the discussion that ensued, and supplied a great deal of useful data and much valuable information as to what was and might be obtained from the colonies and foreign countries. He pointed out that we already received some 10,000 or 12,000 tons a year of starches and their allied farinas, although most of these were of the more expensive class of food substances—the arrowroots, tapiocas, cassava flours, maccaroni, and vermicelli. But when the want was more generally known, the ready market appreciated, and a fair price attainable, thousands of tons of more inferior farinas and feculas suitable for the British starch manufacturers could be readily obtained.

On the continent attention had already been prominently directed to this matter. In Belgium a premium of £400 had been offered for any substance not a food product, available for starch. In France the horse chestnut had been largely utilized for this purpose. In St. Domingo a plant (the *Zamia media*) which covers immense tracts of wild land along the coast and interior, yields very good starch.

The Society of Arts has placed on its premium list a reward for the largest and best sample of starch produced from a non-edible substance, cheaper than any at present in use, and obtainable in large quantities. Here then we find investigation and inquiry has been set on foot. Looking at the small expense of cultivation, and the immense production of tuberous roots and rhizomes of plants yielding starch, in tropical countries, we believe there is a large field open for profitable returns to those who embark in the manufacture. The process is so simple, that no outlay for expensive machinery is required. Some improvements on the ordinary graters used, and a little more attention in washing out the fecula, is all that is necessary. The yams, the cassavas—bitter and sweet—the canna or arrowroot tribe, the curcumas, and hundreds of other roots, are common in South America, in Africa, in the East and West Indies and the Pacific islands. Instead of being raised in patches, these might be grown on a more extended scale. When we see what progress has already been made in the production of the higher class arrowroots in Bermuda, St. Vincent, Barbados, and Natal, there is an ample field for good investment by small capitalists and holders of land. The subject is of interest both to producers and consumers, and the starch manufacturers of the United Kingdom would readily avail themselves of a more extended supply of any new starch or flour that can come into competition with that obtainable from wheat and the potato.

OUR EAST INDIAN AGRICULTURE.

The agriculture of our East Indian empire, extending over upwards of 600,000,000 of acres, is in a very backward state. It was so when this immense territory fell into our possession, and it continues to be so to this day, exhibiting very little signs of progress. What between *rajahism, zemindarism, and a money-making speculation in the British capital*, our Hindoo farmers, or *ryots*, who cultivate the soil, are, perhaps, of all the wretches upon the habitable globe, the most miserable of any—being bought and sold in the market as part and parcel of the lands they occupy, with all they possess. Such was their deplorable condition in 1800, such in 1850, and to all appearances will be so, when time has added another half-century to the responsibility of England. In one word, John Bull has proved himself a worse farmer in India than his predecessor—the Great Mogul.

This is not, perhaps, as it should be, nor as, we hope, it will be. Indeed, judging from the progress of other branches of industry in the East, it is absolutely impossible for it to continue so much longer, for as the loyal subjects of Her Majesty, our East Indian farmers have as good claims to political freedom as the farmers of England.

The solid foundation of all reforms, physically speaking, is an improved and prospering state of agriculture. The greater the produce of the soil, for example, animal and vegetable, the greater the amount of manufactures and commerce, and *vice versâ*, and from the peculiar position of Hindostan, and her relation with England, she is, perhaps, more dependent upon a prosperous state of agriculture than any other portion of the globe. The reverse of this is what she has hitherto experienced, hence the silent grumbling and misery which characterises the whole Empire, from her lowest ryot, without a rag to cover his nakedness, up to the Company, who virtually pretended to occupy her throne. A few Rajahs and princely merchants, perhaps, may have accumulated fortunes; but, generally speaking, her subjects are in a state of comparative beggary, while the few fortunes thus made add to the depth of their misery! Take the present period, or any one past, and few exceptions will be found from this rule.

Now the cause of this unfortunate state of things appears tangible the moment we examine the details of our Hindustanee agriculture. Let us go back, for example, to Hyde Park in 1851, and there compare the agricultural implements and machinery of our Indian empire with those of the English department. Let us, then, answer the question, Did any one of the many English farmers who examined with curious but scrutinizing eye the *modus operandi* of the rude ploughs, harrows, carts, and other *et ceteras* of oriental tillage, there exhibited—formed of bamboo-rods tied or pinned together in the most artless manner—entertain the idea of paying, under the broiling sun of an eastern climate, rent, tithes, and taxes tenfold more exorbitant than anything this country ever knew, and supporting himself and family on the balance of produce in a manner becoming the loyal subjects of the English Crown ?

In order, however, to convey to our readers a just conception of the miserable state in which our Indian agriculture is to be found, it will be necessary to glance at the soil, and its tenure. First, then, we have the largest field of fine land in the world, principally composed of a rich vegetable mould, from *five* to twenty feet in depth, producing a luxuriance vegetation far beyond the powers of language to describe. The fertile plain of Bengal alone, through which the Ganges flows, exceeds the whole area of England. The rivers, again, are large and numerous, affording ample inland navigation, with an abundant supply of water for irrigation ; while timber, and everything else for mechanical purposes, are to be had in abundance. The agricultural products of the country are rice, wheat, Indian corn, barley, peas, millet, sugar-cane, silk, hemp, and fruits in endless variety. The Indian ox and buffalo are reared, but only for the yoke and dairy purposes, butcher-meat not being used, on religious principles. Sheep, goats, and swine are also reared. The elephant is used in war, and the camel as a beast of burden. Cultivation is miserable. What is termed the plough is, properly speaking, a single-shared scarifier ; and the poor ryot, before he can raise a mould to cover his seed, unless among the warp of rivers, has to go over the ground from five to fifteen times with his team of buffaloes or humped oxen. And the work, if anything, in harvest is scarcely any more expeditious, the corn being trodden out by the feet of oxen, as in the days of Shem, Ham, and Japheth. Fortunately for him, his land requires little or no manure.

Irrigation is universal, as no crops can be grown without water, owing to the heat of the climate. The practice is of two kinds : A large area of the country being flat, is annually flooded by the overflowing of the rivers. The Ganges, for instance, like the Nile in Egypt, periodically overflows his banks, fertilizing the soil so as to yield produce sufficient to support a population of 60,000,000 souls ! and, with proper management, might support three times the number. On more elevated grounds, again, the water has to be raised by artificial means. The machinery, or tackle, for this purpose is of the simplest kind, and the same in Hindustan as throughout the whole of the East, being composed of a leathern bag or buffalo's skin, a pulley, rope, and a few poles. A short straight course is made for a buffalo to walk in, backwards and forwards, to and from the river, out of which the water is to be raised. In receding from the river, a skinful of water is raised and turned into an open channel, which conveys it to the field ; and in returning the empty skin falls into the river, and is filled again. Thus the tedious work continues until the land is sufficiently saturated, requiring a man and a couple of buffaloes to every five acres.

Rice and sugar-cane are invariably flooded in dams in size according to the levelness of the ground, and very often the other seeds also. Each ryot, for example, divides his small holding into square plots, each surrounded by a low broad dyke, a few inches high ; thus forming a dam. The work of flooding commences at the highest ground, and when one plot is sufficiently saturated, an opening is made in the dyke, and the water allowed to flow into a second ; and so on until the whole is watered. Down the centre of every dyke a small channel is made, in which the water may flow when required. With the rude tools of the country, the amount of labour required to prepare the land for water is great ; but when once applied, the vegetation is quick, the period between seed-time and harvest being incredibly short. The whole work, however, it must be borne in mind, is rude, and generally slovenly performed in the extreme, from the little interest the Hindoo farmer has in the fruits of his own labour. In some of the hilly districts the soil is not even cultivated at all, the seed being merely dibbled in with a peg and mallet, and the rest left to nature.

As in Egypt, two harvests are annually reaped, and were proper machinery and skill brought to bear upon the soil, England could receive from her Indian empire all the corn she imports, and much more if required. When we look at the valley of the Nile, and the supplies we annually receive from thence, and compare the resources of Egypt with those of Hindustan, it were difficult to estimate what amount of surplus the latter might annually spare, under proper management. That the whole country would produce double its present produce falls a long way within the mark, thus leaving a broad enough margin to make sure of supplying all our wants.

Second. The landlords of Hindustan are of the most despotic character, tenure of every kind being at the mercy of superiors. An instance corroborative of this was a few years since brought before the superior courts of England. The East India Company deprived a rajah or native prince of his property. The rajah appealed to England, and had his property restored, the Company being saddled with the expenses. The rajahs, again, extort from the zemindars, or middlemen between them and the ryots, more than their dues ; while the zemindar in his turn pays no attention to his agreement with the poor ryot, often extorting from him a fourth part more than his rent. The appeal of the above rajah to this country, and the success he has met with, may introduce new ideas among rajahs and their inferiors generally, as we hope it will. But this custom of extortion, says Dr. Tennant, has become so established under the iron sway of an arbitrary government, that the miserable ryot has no idea of appealing to a supreme court for redress. When he has trodden out his corn, and collected the grain into a heap, he sends, with all the religious awe and sanctity of his caste, for the Brahmin or priest, who burns *ghee* and says prayers over it, receiving one measure for his trouble. Then follows the zemindar, who just leaves no more than will suport the poor man and his family, not even entrusting him with the seed for the ensuing crop, that being supplied him when seed time arrives. It is possible, nay, more than probable, viewing human nature reduced to so low a level as that in which the poor ryot moves, that the zemindar, taking good harvests with bad, does not, on an average, receive full payment of rent, and so on with his own superiors—the rajah and Crown, the Hindoo law declaring the king to be the sole lord and proprietor of the soil. As the ryot forms part of the zemindar's property, being bought and sold with the land for whatever he is worth, he has little inducement to become rich himself, or increase the produce of the soil much beyond his own immediate want. Hence the miserable state of pauperism in which we find the whole social fabric of India. Under such a hopeless state of tenure, what good can be expected in the shape of reform ?

" Tenant right," it will thus be seen, is the mainspring of progress ; for until the Hindoo farmer is liberated from his present slavery, and allowed to enjoy the entire fruits of his own labour, skill, and capital, it would be absurd to expect of him more than he now gives. On the other hand, were the chains which now shackle his industry broken from off his limbs, so that he could no longer be bought and sold in the market with all that he possessed, then he could accumulate capital, and consequently would have an inducement to embrace progress, farm better, increase the produce of his land, and be able, at the same time, to give a larger and better paid rent to his landlord; his landlord to the rajah, the rajah to the Government; thus starting at once the whole fabric in a state of prosperity, and putting into their pockets as profit some £10,000,000 annually and upwards, for surplus corn exported to England. There have latterly been introduced some reforms in this respect, but much more is required.

All this is clear as the light of noon-day, so that a proper system of tenure is the first step to be taken in the reformation of our East Indian empire. With the establishment of such, the intellectual capacity of Hindoo farmers would expand. Naturally ingenious, they have a thirst for physical science the moment they are circumstanced to enjoy the benefits it is calculated to confer. This acquired, they would become independent members of society; cease to be the dupes of Brahmin priestcraft, and embrace with anxious inquiry the truths of Christianity.

No other policy than this can succeed in India. We may introduce railroads, and improved agricultural and other machinery, as has lately been done; but so long as those who apply them to the soil and its produce do not enjoy their full benefits, our labours will prove fruitless, amounting to nothing more than the selfish efforts of a few individuals to increase their rents and revenues, without conferring any lasting benefit on the ryots, who form the foundation of the whole social and industrial fabric of the country.

With pauperism and slavery for the foundation, what can be expected of the superstructure?

The day is fast passing by, when fortunes can be wrung from the labouring classes of society through the instrumentality of improved machinery. This is just as true in Hindostan as in England, or the United States of America. An ignorant pauper population is fast becoming the terror of every government, and not without just occasion. Again, give the masses education, and you must respect them accordingly, or they will soon contrive to do without you. Every day's experience is proving this to the whole of Europe; and if we attempt to increase the revenues and rents of Hindostan by the aid of machinery and the like, without first elevating the masses to that level they have a right to occupy, the obvious result is the sacrifice of an empire. On the contrary, in the great work of reformation at issue, let the superstructure be based on a solid foundation, and England may yet experience a value in her Indian empire, which she may not now estimate aright. With the tenantry emancipated, the circulation of our capital among them would give an impetus to the industry of every caste; thus elevating the whole financial circumstances of the country in a corresponding degree, giving to the work of progress more than a buoyant character, and relieving society of all its pauper ills.

No doubt several objections might be made to the above proposition. First, it may be said that the distance is too great to form a profitable corn-trade connection with Hindostan. Second, that until Parliament redeem the dividends of the Company—which cannot take place until after 1874—the Company will prove a millstone about the neck of progress. Third, that the zemindars would object to the emancipation of the ryots, and the agricultural capital of the country falling into their hands. Fourth, Brahmin priestcraft will prove a check to intellectual progress, without which agricultural progress is impossible. But all these fall to the ground. For—

As to the first, nowhere can corn be grown so cheap, under an improved system of agriculture, as in Hindostan; and, with regard to the distance, steam navigation and the "wheat canister" would soon overcome that. Second: The Company's claims amount only to a dividend of "£630,000, being 10½ per cent. on a nominal capital of £6,000,000," just 20s., or two bushels of wheat, to every 100 acres, to pay off the Company altogether! or four bushels for every 100 acres, to cover the double interest of capital. Now, how long would it take a prosperous empire to pay off such a trifling debt? Certainly not more than one year of two good harvests! No great millstone this. Third: From the little value of agricultural stock, the ryots if emancipated could easily pay off the zemindars by instalments, for a short term, if guaranteed against extortions. As the Brahmin priests would have a share of the increased produce, they would be interested in the liberation of the ryots, and hence would keep the zemindars quiet. And, lastly, agricultural intelligence would neither interfere injuriously with the religion of the country, nor its system of castes, but the contrary, and therefore would meet with the support of Brahmins, if properly introduced. The caste system of India is but another name for the subdivision of labour; and, if the interest of that subdivision was properly studied—which would be the duty of Government religiously to do—every caste would enjoy a corresponding benefit from an improved system of agriculture, returning double and treble the present amount of produce, and consequently would gain in the march of progress.

THE FUTURE OF OUR AGRICULTURE.

THE YEAR 1860.

There recently appeared two most interesting and instructive papers—one by Mr. R. Bond, being a lecture to the Halesworth Farmers' Club, "On Agricultural Money-making;" the other, a paper "On the Forces used in Agriculture," by Mr. J. C. Morton, read at the meeting of the Society of Arts, papers which every agriculturist ought to read and attentively study. In addition to this, we have an able article in the *Times* upon the "Progress and Profit of the Steam Plough," equally important with the above. The three papers deserve the reprint that has been given them. Mr. Bond treats chiefly upon what the improvements in agriculture have achieved for this country; viz., that while France is producing its crop of wheat at an average of 14 bushels per acre, America at 15, Holland at 23, Great Britain produces more than 28 bushels; that France, with an area of one-third acreage more than England, produces in meat a value of 64 millions sterling, while this country produces 84 millions of pounds sterling, *i. e.*, 35 per cent. less acreage produces 20 per cent. more of animal productions; that in about 1688 the produce of England did not exceed 2,000,000 qrs., whilst in 1859 the produce of wheat alone was computed at upwards of 14,000,000 qrs., and upwards of 30,000,000 qrs. of grain generally; that in 1815 a committee of the House of Commons declared the yield to have improved one-fourth within the previous ten years; in 1821 it was computed that the yield of wheat per acre was not more than 17 bushels, in

1840 at 26 bushels, and at the present time upwards of 28 bushels—showing an increase within the present century of 70 or 80 per cent. Mr. Bond further states that meat has increased 100 per cent., and that the money-value produced would be from 30,000,000 to 40,000,000 pounds sterling more; that the rental, as shown by the property-tax returns, has increased about £9,000,000 sterling since 1815, and all this with a gradual decreased value in wheat of 33 per cent., and an increase of rental to about 28 per cent. His summary of the whole being that the grain crops have increased from 70 to 80 per cent., and the produce of meat fully 100 per cent. within the present century, *i. e.*, the past 59 years; an estimate in which I quite concur.

Mr. J. C. Morton's valuable and laborious paper—laborious for the extent of his research and the collection of facts—treats upon the actual force or amount of labour brought to bear upon the productions of the soil, of which Mr. Bond gives the result in an increase so great. The forces are *steam-power, horse-power,* and *manual labour.* Horse-power is universally taken to mean the pull or lift of 33,000lbs. one foot high per minute. This is the result of numerous experiments. Such, then, is the force employed by one horse, and it will be borne in mind as the various powers are enumerated. The number of arable acres in the country is computed to be 19,000,000, employing 950,000 men, 120,000 women, 300,000 lads, 70,000 girls, and about 800,000 horses to cultivate and manage them, *i. e.*, this vast extent of land. The average of manual labour, calculating the above by the value of each per day, would bring them to about 1,150,000 men. Mr. Morton estimates the force of a man, as compared with the horse, say per minute, at 250, 330, 500, and 370 pounds, as instanced by four cases named—*i. e.*, a man at various work will lift these respective weights one foot high per minute—the first digging, the second manure-carting, the third pitching corn, and the fourth loading turnips. Mr. Morton also instances several farms, to estimate the horse-power engaged: on one of 675 acres, the whole horse-labour, being converted into weight lifted, amounts to upwards of 100,000 cwts. pulled, *i. e.*, lifted *one mile* per annum—*i. e.*, ploughing 27,000 cwts., harrowing, rolling, drilling, &c., 20,000 cwts., carriage of dung, corn, roots, &c., 60,000 cwts. lifted or pulled one mile; another, of 790 acres, the ploughing is 40,000 cwts., rolling, harrowing, drilling, &c., 35,000 cwts., cartage &c. 25,000 cwts. (but few roots grown, and land level); another, 264 acres, 37,000 cwts., gave 12,000 cwts. cartage, 15,000 cwts. ploughing, and the rest harrowing, &c. He further estimates that no less than 40,000 horse-power has been added to the forces of agriculture, within the past ten years, in steam-power, and that five firms are alone furnishing 10,000-horse power annually from their works, besides what are derived from many other manufacturers. He also includes steam cultivation, and reaping by machinery, as additional forces used in agriculture; the former being a most powerful auxiliary, and the latter so much increased as to be able to cut more corn in a day than 40,000 men. He takes a clever review of the manual labour question, and shews that the average amount of money value for labour expended on arable farms is about from 30s. to 50s. per acre; perhaps about 35s. would constitute a fair average expenditure. For instance, I find No. 1 says 50s. (this on heavy land); several others are named as from 30s. to 40s. per acre; No. 2 32s., No. 3 about 40s., No. 4 40s., No. 5 32s., and No. 6 32s. per acre. He further enters into the subject of the labourers' weekly wages, which it appears vary in different parts of the country considerably, and average from 8s. to 15s. weekly, women 4s. to 6s. weekly. In concluding his very able paper, he sums up the subject in one great and astounding climax—" that of the 800,000 horses employed in agriculture, steam-power will displace at least two-fifths," and " that the wealth of the country—its stock and its produce—shall increase in a faster ratio than the people."

The article in the *Times* with great clearness lays open the whole subject both in its theory and practice; the nature and object of deep culture are ably considered; the varieties of soils and their advantageous management are admirably discussed; the theory of chemical influences, and how obtained from the atmosphere, is ably stated—the immense force required to effect good cultivation deep and efficient; the amount of manual and horse labour required; the defective nature of the present mode of cultivation and of rotations of cropping; of tenants'-right, and tenants' restrictions; taking a clear and comprehensive view of what the enormous, the unlimited power of steam can effect; the immense increase of produce that will ultimately result, particularly from deeply-cultivated clays; and closing with two well-selected facts of farms now cultivated by *steam*—showing that the increase of the produce is equal or equivalent to 8 bushels per acre of wheat, and in value to near 40s. per acre, according to present prices. The article must be read to be appreciated. I have given a very meagre outline of it; but I view it as something auspicious of the future.

One is agreeably surprised at reading articles like the three foregoing, and appearing as they do so near the beginning of the year 1860, it augurs well for the year's commencement. I trust it will be a year of great progress, and that the results set forth by Mr. Morton and the writer in the *Times* will soon be accomplished facts. I have every faith in their anticipation of the achievement of steam cultivation, distant as it may appear to some. It seems almost impossible to increase the produce of some 4,000,000 acres of wheat by 8 bushels per acre, or the country's produce be enhanced by 5,000,000 quarters of wheat, and all other crops in like proportion, including root and vegetable crops, by which an amount of food for stock is increased to the extent of one-fourth in weight per acre, and a larger breadth of heavy land is enabled by deep cultivation to grow these crops, and they will also permit the stock to feed them off, in consequence of the improved lairage from the dryness of these soils, owing to the rain deposits being carried down to the substratum and passed off by the subsoil drains. These subsoil drains are indispensable to effective cultivation by steam power—one of the greatest advantages being the facility given by this deep culture for the communication of chemical influences from the atmosphere, and the ammoniacal deposits from the rains passing through the soil rather than off from the surface. Every medium clay soil possesses an almost inexhaustible supply of mineral and ammoniacal constituents; these only require a deep working, and a sufficient and continuous commingling and exposure of the soil, to bring them into efficient action whereby these chemical constituents become the proper and suitable food for the plants or crops to be grown. It is only by the deep and continuous cultivation in suitable weather that this disintegration of these constituents can be broughtout or abstracted from such soils. The application of a few pounds of ammonia per acre in guano or other manures has the effect of producing a large increase to the crop. What, then, would be the result, if by deep and extended cultivation this supply could always be brought out from the inherent and unbounded stores abiding in the soil, to be made available for the want and healthy sustenance of the crop? For the wheat crop this order of cultivation is all that is necessary; for other corn crops an occasional dressing of manure would be requisite; but the root and fallow crop ought to have a good application of the best fold-yard manure, both to cause the production of it in bulk and to impart to it a nutritive value. Deep cultivation and subsoil drainage are the great things needful for clay lands, and no modes hitherto discovered can vie with steam in producing such advantages, and without poaching or injury to the surface—no treadings, no kneading; but all is left porous, open, and friable, so that the roots of plants may revel luxuriously.

Something must be done to retrieve the circumstances of the farmer; he cannot exist, or carry on his business under the present low range of prices. Unless some considerable advance of prices take place, or some mode of enhancing his productions is discovered, he must sink. I hail this discovery of steam cultivation as one great means of bettering his condition. He does now thrash his corn by steam power; he must also cultivate his land by steam power: he will thus make it more productive at a less cost, and he will have the spare horses, and the food usually consumed by them, to sell. The lamented Henry Handley used to call cart horses the great cormorants of agriculture. How would he have rejoiced to have seen the introduction of steam culture, an achievement he and his friend Heathcote, of Tiverton, did so much to effect! We know but little yet of what it will accomplish, but if we are to have 20,000 horse-power annually thrown into the farmer's hands to apply to cultivating purposes, we may expect great things. As to seasons, rotations, and management, all will be more under the control of the farmer than ever. The system of rotations of cropping must be left entirely to every intelligent farmer's judgment: he must be unfettered and free to manage as his judgment dictates. With a new and most powerful motive-power, he must devise and adopt a far more productive and heavier course of cropping. This motive-power makes him comparatively independent: he can convert his clay lands into friable, open soils, capable of culture at any time; and his light sands or gravels he can cultivate by grubber, roll, and harrow, almost without the plough or team at all, and at such precise periods as he deems best. The general opinion prevails that a low range of prices for corn must be the rule, as our ports are open to the world, and no difficulties lie in the way of importation. Not so with live stock, they cannot come from far; we may therefore pretty nearly keep and secure the fresh meat trade to our own soils; and then follows my suggestion, that our heavy lands must be prepared for those varieties of root or food crops; and I hold it to be a very important acquisition to our agriculture to be able thus to prepare our heavy soils for whatsoever crops we desire them to produce. Our light soils have long produced very superior food crops in turnips and seeds, and latterly in mangels and swedes. We cannot hold out any great hopes of much further advancement for them besides a cheaper mode of cultivation, just at the time needed, and a more extended use of artificial foods, whereby a larger number of stock may be supported, and manures thereby improving the lands, and bettering the crops in a two-fold manner.

I have every confidence in the intelligence, judgment, energy, and perseverance of the British farmer. This has been triumphantly proved by Mr. Bond, and that he has advanced to an extent equal to the progress made by any other class. Mr. Morton shows what forces are at his command, and our *Times* writer points to the application of an immense power. With our heavy taxation, public and parochial, and our liberal rate of wages, it is utterly impossible for us successfully to compete with the other nations of the world, except by our skill, capital, and industry. If France only produces 14 bushels of wheat per acre, America 15 bushels, and other countries in a similar ratio, how is it that we can produce "more than 28 bushels," and the like in our increase of animal food? Why, by our superior cultivation, our selection of grain seeds and roots, and their management, and also by a superiority in our domestic breeds of animals and their management; in other words, by enhanced production in every way; and rely upon it, this is the only sure and certain course whereby we can achieve the prosperity of British agriculture.

We must then, for the year upon which we have now so happily entered, look well about us, and see if there is anything in our business that is wrong. Have we been managing too expensively? Have we adopted those improved courses in cropping, and selected those improved breeds of animals for grazing for which our farms are best adapted? In what way can we best enhance the produce of our farms? In what way can we advantageously reduce our expenditure? In what way can we lay out our capital to greater advantage in the cultivation of our farms and the general management of our affairs?

We live in eventful times: the whole world moves at a more rapid rate than formerly, and we must keep pace with it. We are the providers for the nation, and they will expect a cheap provision from us. Be it ours, then, to do our utmost during the ensuing year for our country's good: be it ours to adopt, and with energy put in practice every established improvement whereby the produce of our farms (which are the increase of a nation's wealth) may be abundantly extended. In entering upon a new year, be it mine, as an old contributor, to congratulate my brother-farmers upon the less warlike aspect of the times. We need not entertain a fear as to the stability of our homes and institutions. Was there ever a more spontaneous, a more generous display of patriotic feeling than is now exhibited in the establishment of voluntary corps for the protection of all that is dear to us? We may, then, pursue our peaceful avocations with the utmost confidence, feeling assured that whatever may be the result of any commotion to other countries, we shall reap that we sowed. I trust the year 1860 may prove a happy and peaceful one, and that the hearts of our friends may be continually cheered by the encouraging prospects dawning before them. Allow "A Practical Farmer" heartily to wish you "A Happy New Year."

EXPORT OF HEREFORD CATTLE AND SHROPSHIRE SHEEP.—The Vincenza has arrived at Sydney, the stock exported in her, consisting of twenty Shropshire Down rams, selected by Mr. Duckham from the flocks of Mr. Williams, of Culmington, Salop, and Mr. Hands of Ludlow, together with a Hereford bull from his own herd, were much admired by the colonists. Mr. Strafford's selection of Hereford bulls, purchased by him from the well-known herds of Mr. Price, of Pembridge, Lord Bateman, and Mr. Duckham, are now far advanced on their voyage to that flourishing colony; and last week those purchased by Mr. Cardell sailed in the John Marshall, from London. Our readers will perhaps remember Mr. Cardell purchased the first and third prize yearling bulls at the recent Herefordshire Agricultural Show—viz, Sir John, bred by Mr. Price, and got by that beautiful and celebrated animal, Goldfinder the 3rd, and Cefuesco, bred by the Reverend Archer Clive. To these he added a yearling heifer from Mr. Rea's herd, of Monaughty, and two Shropshire Down rams from the flock of Mr. Clement Downes, of Eardisley Park, Herefordshire.

EXPERIMENT IN THE CULTIVATION OF THE BEET-ROOT.

[TRANSLATED FROM THE FRENCH OF THE "JOURNAL D'AGRICULTURE PRATIQUE."]

SIR,—At your request I send you the extract of a letter which I have lately addressed to the Agricultural Society of Rochelle, on an experimental culture of beet-root in the South.

I am aware that people are apt to mistrust a little such accounts, as eccentric gasconade, without considering, that whilst mankind themselves differ, there is also the difference of climate, and of the fertility of the soil.

I have drawn about 500 quintals of 50 kilogrammes, and even, to be more exact, 550 from 1,000 metres of land, which is the space I usually devote to my different experiments. *

In order to ensure such a result, which corresponds with 275,000 kilogrammes per hectare, it is necessary to attend to the following eight conditions :—

1. Trench the land deeply.
2. Apply to it a large quantity of manure.
3. Confine the plants strictly to one foot every way.
4. Water, by immersion, every fifteen days, when rain does not fall.
5. Give a second tilth after each irrigation, so far as is possible.
6. Prune those plants which are disposed to run to seed.
7. Abstain from stripping off the leaves.
8. Draw them not till the end of November, when all vegetation has ceased.

First. Deep digging allows the plant its greatest development in the length of the root, and probably also in all its proportions.

Second. My land (still 1,000 metres) was manured with twenty cubic metres of good dung, and three measured quintals † of colza cake.

Third. The seed-plot was made on a hot-bed under glass, and the seed put in on the 1st January. I planted them out in April, when they were about the size of the finger, and when others were sowing the seed. This early forcing is essential to success, the roots having had thereby nine months of vegetation when I drew them at the end of November ; and as they gain one concentric circle every fifteen days, they had acquired eighteen at that period, which is six more than the sown beet-root ; and as the last six are the external rings, the volume of the beet roots had more than doubled.

Fourth. The beet-root not throwing out fibrous roots to a distance, it is a plant that may be set close together upon the land : I had observed in my seed-bed that plants proceeding from the same hole, when the burying was incomplete, came up, notwithstanding their proximity, as fine as the others.

Fifth. In order to make a seed-bed complete, irrigation is indispensable with us. Circumstances having deprived me of the power of irrigation the last two years, I no longer obtained the produce I announced to you ; at the same time a certain discretion is required in the employment of water ; otherwise the roots, in growing, are apt to become hollow.

Sixth. A second hoeing is necessary after the irrigation, because the sun and the wind dry so rapidly here, and it is beneficial to break at the surface the homogeneity of the soil. However, in this close and luxuriant cultivation, the plant is not long in covering the ground with its domes of verdure ; and it becomes difficult, after the third hoeing, to execute a fourth. But neither the sun nor the wind any longer affect the root, which undoubtedly, under these shades, then enters into those gaseous combinations which accelerate the vegetation of the plant, without the intervention of the hand of man.

These beet-roots, which are thus forced, are very liable to run to seed ; but by cutting off the stalk when it makes its appearance, the movement is stopped, and the root steadily increases in size like the others.

Seventh. Stripping off the leaves, especially during the dog-days, stops the development of the plant.

Eighth. Do not draw them until November, when all vegetation has ceased. In October and November the roots double their weight if the season proves warm.

Such is the secret of our 275,000 kilogrammes per hectare ; and the inference is easy to be drawn from it, 5,500 days' food for any animal of whatever kind. For I have never been able to make any cows eat more than 50 kilogrammes (1 cwt.) per day. They are small, it is true ; but they grew fat upon that allowance.

I am delighted at the publicity given to my attempts, for they would remain here, in the South, a long time isolated, where the farmers appear, more and more, to lose sight of cattle feeding, and devote themselves to industrial cultivation, which is upheld only by the purchase of artificial manures.

The Penitentiary of Mattray, at my desire, has also cultivated beet-root by the Koecklin method. His first experiment has doubled his produce without any additional manure. He obtained more than 80,000 kilogrammes per hectare.

At Grenoble my brother has seen, in the month of September, a field of beet-roots cultivated by the same method, the roots of which had reached the average of 14 kilos (35lbs.) ; and, allowing only 20,000 to the hectare, they had already exceeded the amount I have indicated. But that was only in September, and they had still four concentric rings on the outer surface to form ; and my produce would be exceeded, on an extended scale, in those lands so rich naturally, and saturated with manure for centuries, and in which they cultivate hemp almost without intermission.

It is, therefore, by a warm climate, abundant manure, irrigation, forcing, and good hand-labour, that my result is to be attained.

If the roots have not nine months of growth, of heat and moisture, those grand principles of vegetation are in weak proportions : if frequent storms render the radiation less powerful, the ultimate result would undoubtedly be different.

This limit which I have now reached, and which appears extraordinary, is not, be well assured, the last we shall hear of intensive culture. We have seen, on the bank of the Canal of St. Gilles, on those lands which yield such prodigious harvests of grapes, a beet-root weighing 60 kilogrammes (150lbs.). How many would be required to make 10,000 quintals* (500 tons)? and can we not study, and realize afterwards, the conditions which have produced this phenomenon ?

This question has given rise to a discussion similar to that which made so much noise in England, in which certain persons persisted in denying the miraculous produce of Italian ryegrass. The cultivators of timothy-grass did not give the cause of that produce of 500 quintals (25 tons) per hectare. But when I look upon all the care bestowed upon it—the showers of liquid manure and the drainage, and steam coming to the help of man—I, for my part, am convinced of the truth of the assertions. They have sought for their plant at the extremity of Italy, and, laying under contribution that energetic native of the South, have united it with the industrial activity of the North.

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* This result gives 308½ tons per hectare, or about 123 tons per acre.—TRANSLATOR.

† About 6 cwt.—TRANSLATOR.

* 7,466 roots.—TRANSLATOR.

And we also have our game to play. We will go to the Tropics, and bring from thence those vigorous grasses, the annual shoots of which exceed in height our coppices; and the *Panicum*, the *Arundo*, and the *Echinops* shall cover our fields.

AUGUSTE DE GASPARIN.

A FARM TO LET.

FARM TO LET. And the whole world at once becomes keenly alive to the fact. There is scarcely any kind of advertisement that would tell better. A. B. or X. Y. Z. is inundated with applications by the very next post, and for a week or two resigns himself to quite a plague of correspondence. Should he only further announce where he may be met with, the matter becomes more serious still. There is always somebody waiting to see him, while candidates for the place lour at one another in ante-rooms, or race for it from stations and way-side taverns. No matter where he may be, in the wilds of Wales or the suburbs of London, good men are sure to follow him. They have all alike capital and character at their backs, and the only real difficulty is to make a selection. Or, even put it less publicly than this. It comes merely to be whispered that the tenant at the Grange is "going." He has made a fortune or lost one—it does not much signify which it be—or has committed himself in a rather too independent speech at a market ordinary—or has voted the wrong way—or has complained of the game—or refused to submit to another rise—or has courted his notice to quit in some shape or other, and has got it. Never mind what the reason is. There are plenty of friends and neighbours more than anxious to stand in his stead—to make fortunes or to lose them, but never to make speeches—to vote black or white as they may be directed—to have no objection to a good head of game, and to pay a higher rent from to-morrow morning. The price of wheat may still promise a falling average, but this after all can have very little to do with the business. Farms continue to let well, and more people than ever wish to have them.

Of course one of these causes conduces very much to the other. For a comparatively long period, too, has this been so. Agents who have their estates in anything like proper condition know this well enough, and the tenants are equally aware of it. An eligible farm will now be taken by some one or another on almost any terms. If the cautious, practical man hesitates, the dashing speculator jumps over his head in an instant. And yet we continue to argue the nice question of Landlord and Tenant as if it was quite an even-handed, give-and-take proposition. The owner of the soil, to begin with, should not entertain the offer of any man who has not both ample means and experience to support his application. So far so good. With the slightest possible precaution, such a sort of occupier is very easily available. On the other hand, it is maintained the tenant should never think of entering on a farm without he has a long lease—no restriction as to cropping nor cultivation covenants—the right of the game reserved to himself—freedom of opinion—a fair rental, and so forth So far is this so good again, but only so far as it is feasible. In ninety-nine cases out of a hundred, the man who stipulated in such a wise for the Bill, the whole Bill and nothing but the Bill, would never get into a farm at all, unless he travelled to the banks of the Nile, or discovered it for himself in some "new country" in the Colonies. But it is sufficiently noticeable that, even as regards that great "indispensable," the long lease, a large body of the tenantry care little or nothing about it. There are many extensive estates at this time where the offer of one has been generally refused. Despite the increase of competition, and the more expensive business farming is every day becoming, men would appear to be best satisfied with fair compensation clauses, allowing them a due return for what they left behind them when it was fated they should go. Naturally a great deal of this is traceable to a good understanding, or kindly feeling, between the two classes. And here, as by far the stronger contracting power of the two, the landlord and his agent may still do much to render the position of the tenants what it should be in an age when so much in the way of intelligence, skill, energy, and means is required of them. Discuss it as we may, the farmer has not the opportunity to dictate his own terms. He cannot break through the standing orders and model agreement of the office, and say, "I will do this land just as I like, and on no other conditions." It would be vain, indeed, for him to tell the country gentlemen there should be no more shooting about these parts. But, on the contrary, a little mutual consideration may do a great deal. The progress of agriculture within the last twenty years, say what the critics will, has been very marked in this country; and to a man who has been educated to appreciate such an advancement you can offer no greater injustice than a line and rule "form," that enacts he shall go just so far as his forefathers did, and no further. There must be a little more liberty of action; some gradual giving way to the spirit of the times. It will be the same with the preservation of game. When the due use of every acre of land is looked for, some limit to such an excess must come. On many of our most famous properties such a course has already been adopted. Modern agriculture, in a word, is being permitted a fair opportunity of developing its capabilities, and under such circumstances rents may yet remain comparatively high, though in a corresponding ratio corn is relatively low. By the more recent signs of the times corn rents would threaten to go out of fashion.

Let it not be assumed that we are writing up rents. Very far from it. We are simply speaking to facts. The laws of supply and demand have always regulated each other. The run for farms was never stronger than it is at present. Whether this be warranted or not we need not stay to consider. If, again, it be the more legitimate bidding of one practical man against another, or merely a certain "rage" amongst amateurs, is not so much to the purpose. However it has come about, the owners of the land have the game very much in their own hands. Let them not abuse any privilege they may have of making their own terms, but rather let them be more careful and considerate for those they are dealing with. With the right man insured, they can, when once he is in, hardly leave him too much to himself. The duties of the agent should centre pretty much in receiving the rent and authorizing the repairs. The keeper should have the least possible interference with him. Farmers are beginning to thoroughly understand their own business. Or if they do not, if anything should be going wrong, there will be plenty of good-natured friends ready to give you a hint of it. Remember how much Gaffer Grey would like the place for his boy, or how many hundreds of others would jump at it.

There has been some little debate lately as to whether farms should be let by tender or not. Mr. Greenhow Relph and Mr. Henry Higgins have been arguing the point rather warmly down in Monmouthshire. But, after all, there is not such a vast deal of difference between the two systems. A landlord who puts his place up by tender, *not binding himself to take the highest offer*, comes very much to the same conclusion as the one who does not countenance this objectionable plan. Either will have the best man, at the best rent, he knows of. In truth, with the competition there now is, it is next to impossible to ignore tender in some way or other. Let a holding once be in the market, and, either directly or indirectly, there are sure to be biddings for it. But the good feeling we have referred to as so often existing between the two, will generally induce a landlord to retain an old tenant if it be possible. There is a mutual pride in such relationship. If, however, it cannot be—once advertise "This farm to let," and a clever agent, though he may not descend to recognize offer by tender, will bring it very much to the same thing. It is his duty, infact, to ascertain who will give the most rent, and then to consider if the bidder be an acceptable tenant. Letting by tender does no more. A canny Scotchman, Mr. Gentle, said at a meeting of the Inverness Farmers' Club, the other day, "He was not prepared to recommend any change either in the mode of letting land or as to the term of admission or demission. Landlords were entitled to the same freedom as other vendors in bringing their properties into the market, so as to make the most of them. They, as tenants, had a horror of advertising, particularly in regard to the farm possessed; but, if they needed a farm, they had no objection to see the broad sheet full of advertisements." Still, the letting by absolute tender anything but prevails, the more especially on this side of the Border; neither do we think it is a means likely to become popular. To the landlord it could only bring increased risk, and this is certainly not what we have been striving at. With such opportunities, it will be his own fault if he does not get good tenants, while the great boast of an English gentleman is to keep them. Proper consideration, and due liberty of action, should be the leading features of his more modern agreement; and he may so maintain a good rent and a good character.

TOWN AND COUNTRY.

Why should there be any hesitation about the application of our towns' sewage to agricultural purposes? Surely, "boards" are the woodenest things in existence, and the most wooden of all Boards is perhaps that which contemplates the voidance of the sewage of the metropolis into the Thames, be it above Erith or below it. Is it true that we are expending annually £3,000,000 in the purchase of foreign guano, and are at the same time arranging at a terrific cost to expel the excrements of 2,500,000 human beings, of 60,000 horses and other animals, with all other refuse from such a population, as useless and abominable? What, then, becomes of the teachings of science? What becomes of the assertion of chemistry, that nothing is lost? We seem to take a dangerous delight in contradicting all sound maxims of economy in this matter, and provoking that "woeful want" which logically waits upon "wilful waste." Is it not observed, too, that we thus seek to shatter the connexions of that beautiful cycle of life and decay, which is so well symbolized by the serpent, who forms the circle of eternity by uniting the head with the tail—the end with the beginning?

A few days since, a writer in the *Times* said, with great humour, in treating of this subject, that London, like ancient Rome, seems likely to melt and disappear in her main sewers. The analogy, however, is more than humourous; for if we cast away as worthless 70,000,000 tons of manure, which would give an annual supply of 40 tons per acre per annum to 1,750,000 acres round London, and more than quadruple the produce of the land, we are inflicting a terrible injury upon our entire country.

Mr. George Sheppard, C.E., is my authority for saying that the quantity of liquid manure might be distributed for £8,942,500, while it would produce a revenue of £1,120,000 per annum, or 12 per cent. upon the capital employed, inclusive of working expenses, giving each farmer 50 tons of sewage for 20s., or 750 tons for £15—the price of one ton of guano. These 750 tons would contain the elements of 3 tons of guano, according to analytical data, in a state much better fitted for assimilation by the rootlets of plants than the best "Peruvian," which always requires the medium of rain before it can be of use to vegetation.

In contrast with this statement, what will be the cost of the proposed designs for draining London, and what the countervailing return! It may be said, in reply, that an improved death-rate forms a very satisfactory return. True; but is a reduced death-rate inconsistent with the use we are taught by Providence to make of all refuse and decayed matter in building up fresh life?

The Registrar-General, in his last quarterly return, shows a large diminution in the rate of mortality to have taken place, which he ascribes to the supply of better water, the abolition of cesspools, and the various sanitary works carried out. Whilst I rejoice over this fact, I cannot but see that the money so expended by one municipality might have produced even greater results, for in a very few cases is the sewage used. Some one, in giving a definition of dirt, describes it as a thing in a wrong place. This is true. It is death in the town, but life in the field.

Nor is any one competent to say that this is mere theory, or that it will not do to waste large sums of money in mere experiments. I speak of that which has been amply proved in many parts of the kingdom by farmers who have diverted streams charged with town sewage for the purposes of irrigation, and by others who have sunk tanks, set up a system of pumps, drains, hose, and jets to force and carry the life-stream in seasonable showers from this great stomach of the farm, where all the refuse is roughly digested and melted down to the requisite fluidity. It is idle to question results which appear in every newspaper, and facts which are detailed at every gathering of farmers. Everybody who has given attention to this subject can point to meadows that once yielded one reluctant crop of grass per year, and now furnish five or six, and give a good bite for cattle late into the winter subsequently.

In a letter which appeared in the *Times* last week, it was stated that the land did not require manure, but only deep cultivation, to restore its fertility. This may be true to some extent; and I am not one—believing as I do in the excellence of the principle introduced by the Rev. Mr. Smith, of Lois Weedon—to underrate the value of deep digging and a free and earnest appeal to the subsoil for stout straw and full ears; but still one of the great drawbacks to that system lies in the fact that it requires more hands than the old one, and, as our rural population is rushing to the great urban centres, this lack of labour is becoming a grave difficulty. Furthermore, the comminution and aëration of soil may do capitally for cereal and root crops, but it certainly is not to be adopted with our pastures, which alone, perhaps, would dispose of as much liquid manure by irrigation as we could supply from all our towns.

Another objection raised to the application of sewage is to its smell; but those who use the sewage from towns, and those who live in neighbourhoods where it is used, state that this objection has no foundation. Manure in a solid state does emit an odour prejudicial to human life, but water is a great deodoriser. The smell from the sewage discharged from Fleet Ditch sewer, the largest in the world, is not so offensive as the stench from one very small stagnant cesspool.

I look in vain upon every side for a valid objection to this great and desirable project, and more than ever agree with Lord Palmerston, who said at Lewes, in 1851—"The dirt of our towns ought to be laid upon our fields; and if there could be such a reciprocal community of interests between the country and the towns, that the country should purify the towns and the towns should fertilize the country, I am quite disposed to think that the British farmer would care less than he does about Peruvian guano."

Instead of seeking investment for their money in foreign ventures, and in shoring up the tottering thrones of despotism abroad, our capitalists—in turning attention to this great work of applying the sewage of London and our towns to agricultural purposes—would, beyond the satisfaction of receiving good dividends, feel that they were conferring a great boon upon the entire community. HOWARD REED.

THE ECONOMY OF THE STEAM PLOUGH.

On the authority of a recent publication, the origin of that wonderful germinating discovery, the possibility of spinning cotton by a machine, was on this wise:—A number of Blackburn people greeted the evening arrival of a travelling chapman with his string of pack-horses from London, inquiring "the news," and among other things, "if the King were doing anything to relieve poor weavers? "The best thing he could do," said the man of commerce, "would be to make the lasses spin more yarn." "Then he must make the wheels spin two threads at once," replied a gallant weaver; to which another responded "Nay, man, that's nonsense; the King nor all the Parliament canna do that." A thoughtful man stood among the company, and presently united with the chapman and others in a social pipe and glass at a public-house. Here, in their fun, they dare the smart young chapman to obtain from a bonny lassie, who sat spinning in a cosy corner, a favour to which he could not be entitled in the entire absence of a mistleoe; a challenge at once resulting in a noisy commotion, and, among other things, an overturned spinning-wheel. James Hargreaves, thinking of the "two-threads at once," sees that though the wheel is upset, it still keeps revolving, the spindle being now vertical instead of horizontal; and thereupon he draws the roving of wool towards him, the rotating spindle twisting it into a thread. In a brown study, he went home; with a burnt stick, sketched upon the floor of his cottage the rough figure of a machine, in which was a contrivance for holding the rovings as the finger and thumb do, this contrivance also travelling backwards on wheels, so that, say eight threads might be spun at once by as many upright spindles, driven by bands from a horizontal wheel. And this invention he named after his wife, so noted for her superior accomplishment as to be called "Spinning Jenny." The marvellous development of the cotton manufacture of Great Britain, the consequent multiplying of population, spread of great cities, increase of commerce, created home market for agricultural produce, &c., &c., originated by this simple mechanical invention, is too voluminous a topic for us to dwell upon. But all has come to pass in the short period of ninety-three years.

When the history of modern agriculture shall come to be written in a future age, we have no doubt that humble and simple experiments which have been made not long ago, in attempting the problem of tilling land by a machine actuated by a motive-power which made the "jenny" such a wonder-working agent, will be chronicled with a similar interest. We have on former occasions adduced our share of facts and materials for such reminiscences, and shall now employ the above narrative merely as an illustration. The immediate "saving of labour" was so great and desirous that the machine proved an immediate success. Weavers no longer had to loiter in idleness because waiting for more yarn which the hand-wheels could not supply in anything like the quantity even at that time in demand. Now, mark this expression, "saving of labour." The spinners worked as industriously as before; how then can their labour be said to have been "saved"? The fact is, that the amount of labour devoted to spinning increased after the introduction of the machine; and has gone on increasing to a most enormous extent, after the water-wheel and the steam-engine were applied to "save" the very labour of the hands which turned the crank of the "jenny." More labour, increased employment, have been the result, instead of diminished labour. But the "saving" has been, that the same amount of toil formerly wasted in forming one thread now economizes itself by producing an immensely greater number of threads in the same time. Hence, "saving of labour" may often mean "increased economy of production." Mill-power introduced into any manufacture does not necessarily lessen the amount of human labour engaged but renders it more profitable by enabling it to produce more largely and cheaply. Well, we cannot expect the warm-hearted steam-boiler, with its reciprocating piston-rod and rapid fly-wheel, to work away for us in farm operations upon any different terms to those it imposes in other handicrafts. So don't let the farmer deceive himself with the idea that his irksome item of weekly payments on account of labour, and the egregious expense of having to give up such a great proportion of his land and its produce to the feeding of his all-swallowing horses, are going to be shortened, and a saving to ever such an extent effected in his annual outlay, by the adoption of steam ploughing. "But the steam-engine works at such a much cheaper rate than horses or men: steam-power costs 5d. an hour, while horses cost 9d., and manual labour a vast deal more, in accomplishing the same amount of work." Yes; that is all right. But looking at the matter in the light of the future, you will perceive that under steam-power-husbandry, your necessary capital per acre, and your yearly outgoings, will at least equal what is burdening you at present; only here will be the difference—you will be far better able to stand all draughts upon your purse, owing to the improved tillage and more even and yielding crops that will be secured. On real clay land, to be sure, where the tillage by animal power is now frightfully dear, there is already found to be a very great saving in actual outlay. On very light land, the fact of superior economy in working is not so satisfactorily proved as we might desire; and on medium loamy lands, the most extensively found of all soils, we take it as sufficiently shown by experience already had, that the diminution of the horse and hand labour bill will be nearly balanced by the expense of working the engine. Do not imagine that because steam does certain work for 5d. that horses could not accomplish for less than 9d., therefore it will plough or cultivate with this proportion of economy. The calculation refers only to certain labours suited to the two powers respectively. A neighbour of ours views the matter, however, in a very different light; instead of expecting large things, he can perceive only additional outlay without sufficient work done. And it is quite true that many honest farmers as well as he can see no farther than their noses when a real novelty in management is placed before them. This is his statement of the steam-plough question: "I rode over to Mr. ——'s last week, saw her at work, and inquired all particulars. She lays him in over 40s. a day, and ploughs 6 acres, which is nigh upon 7s. an acre. Now 6 pair of horses, with men to plough with them, would do just as much work for the same money; so where's the saving? He only ploughs as many acres in a year as he did before—so he gains nothing. It is true that, though he has sold off six out of his fourteen horses, he is able to plough ten acres in a day with the remaining eight horses and engine together, instead of only seven acres, which was the quantity when he had the fourteen horses only: I grant he is winning in point of time. But the six horses he has got rid of used to cost, with labour, *only half* the money per day that the engine now comes to; so there is, in my opinion, a sovereign or twenty-one shillings a day being spent just for the vally of getting three acres a day more work done. Is that like a paying business?"

A nice little fallacy underlies our friend's ingenious calculations; he has forgotten that though the teams have to be kept at equal daily expense all through the year, in order to get their work done at the old rate of seven acres per day (having, as he, in his easy afternoon style of management, may consider, "plenty of time to do it in"), the engine works a much less number of days in a year, and so, while at the same cost per day, comes to much less expense for the year. We know that Mr. ————'s ploughing is about 300 acres in a year; that is, about 43 days' work for the 14 horses, amounting, according to our friend's computation, to £105 expense. This acreage of ploughing is only 30 days' work for the engine and 8 horses, amounting to just the same sum—£105. The keep, &c., of the 14 horses for the remaining 322 days in the year, is, say £560; while in the other case, the maintenance, of the 8 horses for the remaining 335 days of the year, comes to only £335, saving, therefore, no less than £125. Our worthy objector will smile when he sees all this in print, and wink knowingly to himself as he thinks to pose us with this rejoinder—"The 14 horses would *not* have been kept in idleness, they would earn their living in other operations." For which we have this extinguishing reply—"As 8 horses are now found sufficient for all those 'other operations,' 6 must have been supernumeraries all these years past, and would be wasting all their cost, if the farmer can do as well without them. The engine, too, is set to other work as well as the horses."

The steam plough will effect a saving greater or less on most farms which are absolutely light thin land; though, as we said before, the gain is to be looked for in economy of practice and large yields.

WHY DON'T THE HENS LAY?

"Sir,—Last summer, my one dozen hens gave me nine and ten eggs regularly every day, Sundays not excepted; but now, when the neighbouring grocer charges 'four for a shilling' (three cents each), the 'egg-fountains,' as old Diogenes has it, are all sealed up, and 'nary egg!' has been the tune for a long time. Pray, Sir, what is the cause of this falling off? It cannot be for the want of food, as I make it a point to keep corn constantly by them; and when there is no snow on the ground, I give them water. There is also an open hovel that they can take shelter under and roost in, although I find many of them prefer to spend the night in the tops of the neighbouring apple-trees; and, singular as it may seem, the colder and more forbidding the night, the higher they go for a roosting-place. Now, if there is anything more I can do for them, please inform me, a recent subscriber to the *Agriculturist*.

"*Addison County, Vermont.* "J. S. Angell."

Remarks.

In the summer, the fowls obtained an abundance of animal food—worms, grasshoppers, bugs, and other insects. In the winter, these supplies are cut off. Try feeding them daily with bits of refuse meat; and see how eagerly they will devour them. Some kind of animal food is almost indispensable for laying-hens. Milk or milk-curds make a good substitute. Scraps or meat-cake, easily obtained in large quantity and cheaply from the lard or tallow-triers, are very good for fowls (in this city it is sold at a low price, in large cakes the size of a barrel-head, and eight to twelve inches thick—sometimes in square form). The price is usually about 20 dollars per ton—one cent per pound. Let the fowls have meat in some form. In summer they get green vegetables. In winter let them have cabbage-leaves, turnip-tops, or potatoes or turnips boiled. Corn is passably good for fattening, but not to make eggs out of alone. Oats contain more egg-material. To lay *well*, they should have warm quarters, where water will scarcely freeze. Let them always have plenty of unchilled water; snow is a poor substitute. They want a scratching-place, or, at least, access to gravel; and without lime, they cannot make egg-shells. Finely-powdered bones or oyster-shells or old mortar supply lime, which they must have in some form. They have constitutional objections to laying eggs without shells. An ash-heap, to roll in, is good to keep off insects. Access to the sun, on warm days, they will plainly show you is a treat they enjoy. In short, give them meat or milk for animal food, with some soft vegetables; lime to make shells of; plenty of water to drink, and to supply the liquid part of the egg; as much mixed grain as they like to eat, and gravel to grind it with; clean, warm houses and nests, with air and sunlight, to keep them healthy; and you will unseal the egg-fountains. The nearer their winter food and habits can approach to those of summer, the nearer will the supply of eggs be equalized.—*American Agriculturist.*

THE APPLICATION OF SEWAGE TO LAND.

BY MR. P. A. HALKETT.

Mr. Mechi purposes to introduce a discussion upon the sewerage of towns, as it affects agriculture, at the London Farmers' Club, on Monday the 6th February, by reading a paper upon the question. Being a member, I would be happy to draw the attention of some of the gentlemen composing that club, which numbers in its list engineers, chemists, land agents, draining-engineers, landowners, and agriculturists, to some important points of the subject scattered here and there in the vast amount of discussions and reports which have been published during the last few years, together with some new and important facts, detailed in the last and in the preceding number of the "Journal of the Royal Agricultural Society," by Dr. Voelcker, and also to some by Mr. Bailey Denton, which, as I hope in this letter to show, bear upon the point, and plainly prove that the question is at present one very nearly approaching a perfect certainty of solution, and that it only remains for some commercial men, or public boards interested in the riddance of the refuse of the metropolis, to apply themselves to the point. What I shall here suggest will also apply to many other large towns in the Kingdom, and should enlist the careful consideration of their inhabitants.

The question of the profitable application of sewage matters, is also still occupying much of the public attention: and at the Civil Engineers' Institution, the matter was proposed for consideration by the president, Mr. Bidder, a few weeks ago. It is in this, the mechanical view of it, that I propose to point out a way of dealing with the subject, that will be exceedingly inexpensive, and, if successful, will yield a profit that will go far towards paying back the annual rate which must be incurred by the metropolis for the construction of the sewage works.

In one point of view the system I propose is not new; on the contrary, it has in the main been adopted before, with more success than any other, and for the longest existing periods. It is to the mechanical way of arriving at the same agricultural result, that I wish to direct the public attention, as obviating many of the objections appertaining to other proposed systems. In fact, it very nearly resembles the one proposed by Mr. H. Austin, C.E., but in some important points it differs from it.

The system I propose is, the application of the sewage matters to the production of grass crops—not a new proposition, certainly, nor one, on the other hand, that can for a moment admit of a doubt of its complete efficacy, if only it can be done economically, and without a certain number of objections, which it will be my duty to mention, and to answer. It is upon the point of the objections that I will chiefly bring the scientific facts which I have mentioned, to bear. But before doing so, I will detail the mode which I consider should be adopted.

I propose that at various places along the line of the large intercepting or main sewer, which is to proceed nearly parallel with the banks of the Thames, the sewage shall be taken out from the main sewer by small steam engines, of power proportioned to the breadth of land proposed to be irrigated; the sewage to be forced up an iron-pipe to the level of the highest portion of the land, and from thence to be distributed over the rest of the land by gravitation; with the aid of under draining it would then percolate through the soil without the possibility of stagnating on the surface; the water thus filtrated being led back by the drains in the direction of the steam-engines, to be again pumped back into the main sewer, and so out to sea. The above refers to those lands *rising* from the main sewer; whilst in those lying below, or falling from it, the sewage would be gravitated *from* the main; and after percolating through the soil into the drains in the direction from the main, would be led back and forced into it by the pump. Such lands as are nearly level, would be treated in either of these two directions; but in all cases, the plan should be to pump *direct* from the main sewer, at once distributing it over the portion of the land which that day is to be irrigated, allowing it to percolate through the soil and the drains, divesting it of all its fertilizing matters, and so far purifying the sewage in its course towards the Thames. I would require by my system no apparatus or means for precipitating the solid parts of the sewage, to be afterwards conveyed, at the trifling amount of its value, on to the surface of the land. These systems are all expensive, and, if desirable, may be adopted at any future time. But I would recommend a sieve or grating to be placed where the pipe enters the main sewer to prevent substances too large for the smaller pipes to pass. The system of conveying the liquid by gravitation over the field, would not involve the necessity for open ditches or gutters, so that no deposit would take place to cause any effluvia; and always on the cessation of distributing the sewage over the lands the pipes would be flushed with fresh water by the last turn of the force-pumps.

This system would also require no costly reservoirs to contain the sewage, involving a large accumulation when the works are at rest (it would then pass away in the main sewer), neither would extra pipe-room be required for irrigating on occasions of heavy rain-fall, nor space to contain it till wanted. In fact, the present sewage works having been accepted by the nation as necessary and proper, that question is decided.

The distribution of the sewage would be conducted in each case upon the plan most suitable, according to the formation and style of the land to be irrigated, but in all cases, whether in panes, as in the Edinburgh meadows, or upon other plans, it will be imperative to have pipes instead of open ditches. In the plan recommended by Mr. Austin, pipes are proposed in connection with the small gutters of Mr. Bickfield, which being cut only two or three inches deep, can never form any source of annoyance, more than any other part of the surface of the land. In Mr. Edward Ellis's account of various works executed upon Mr. Bickfield's system, the cost for cutting the gutters does not amount to 1*l.* per acre. The largest amount of pipe-work over the field would evidently be laid in their descending inclination, and these would be of earthenware. These were originally tried with jet and hose; but although suitable for conveying water by gravitation, they are not so when water has to be pumped with a pressure from the jet, nor are they adapted for forcing water up any considerable elevation.

The cost of the system for one block of land of 300 acres would be as follows: Value of land at 30 years' purchase of rental at £5 per acre, £150; thorough draining per acre, £6—total, £156.

Large iron pipe, to convey water to highest point of land, laying down ditto, &c., £400; engine of 10-horse power, pump, and building, £600. The system for distributing the water would be according to circumstances, and differing in cost; but the whole may be taken, on an average, at £15 per acre.

Annual interest for capital: Rent of land and interest on drainage, per acre, £5 8s.; interest at 7½ per cent. on works, and 15 per cent. on engines, £1 4s.—total, £6 12s.

Thus £1 4s. represents the increased annual outlay upon land contiguous to the main sewer. For land 1 mile or 1½ mile distance, the annual increase—considering the general flat character of the district proposed to be operated upon—would be no more than 6s. and 9s. per acre respectively, the increased charge being upon the greater lengths of the main pipe and the larger engine. What the extent of land is which would eventually be required for the purpose is not at present the question. Our object should be to ascertain whether any beneficial use can be made of the sewage, and whether any money can be returned, irrespectively of whether or no the whole sewage can be so used. This is our first point; and the cost of making the experiment is so little, that there should be no hesitation in making it. The land may be hired at £5 per acre: five acres will be quite sufficient. One steady man at £60 a year, a portable engine of four-horse power, and pump, a portable shed, and the piece of land well drained and divided by a ditch from the surrounding land, would all be done for, and the experiment be carried out for three years, at a cost, including outlay and annual charges, of £400. Or if the confidence of scientific men is obtained in the proposed system, ten, or fifty, acres could be laid down without any great risk, in comparison with the benefits to be obtained by the public, if the results are successful. Independent of the advantage of purifying the sewage running into the Thames—an acknowledged important object—what would be the profit of the system? According to the Edinburgh experience of sewage (the analysis of which is not, in any particular, different from that of the London sewage), rather less than 0½d. is returned in value of crop for every 1d. in value of ammonia, phosphates, &c., in the sewage.

The quantity per annum put upon the Edinburgh meadows, in those parts where the most is used, is at the rate of eight to ten thousand tons per acre; the value of the fertilizers of which, at 2d per ton of sewage, is £66 and £83 per acre; and the produce of grass for the year sells for £25 and £35 per acre, and in weight is equal to 70 tons and 80 tons of grass, being about a ton, it will be perceived, of grass to every sovereign's-worth of fertilizers in the sewage.* At Milan—in a climate more likely, it might be thought, to produce larger results than the cold climate of Edinburgh, and where about 10,000 tons also are applied per annum upon an acre—the results, instead of being greater, are less per acre, being only 22 tons of grass (besides the feed, which perhaps may equal 2 tons more, equal to 24 tons), but are better in regard to the appropriation by the crop of the fertilizing matter in the sewage; for it must be understood that the liquid is comparatively weak, 160 gallons of water being mixed with the sewage per head. The value must, however, be even less than one-fifth of that of London, which is mixed with 30 gallons per head of population, because the solid parts are excluded, and something may be deducted for the difference of the food and living of the people. The value, at one-seventh that of London, would give rather more than one farthing per ton of sewage, or for 10,000 tons £11 per acre in one year; while the returns—if the Edinburgh value of the grass be considered for our purpose, namely, 10s. per ton—would be £12 per acre, which shows us, as I have said, a rather better result for the manure than in Edinburgh, though not so very much better as appears at first sight: for these reasons—a certain amount of the grass is due to the natural production by the soil, and a certain amount to the water, as plain water, although it must be remembered that all waters in their natural state are not beneficial to grass. How much is due to these we at present have no means of telling: but venturing a supposition—if we take it that 7 tons of grass is due to the land, and 7 tons to the water, it would leave in the Edinburgh case 64 tons, equal to £32 returned for £83 worth of ammonia, &c., in the sewage; and in the case of Milan, it would leave 10 tons, equal to £5 returned for £11 worth of ammonia in the sewage. The above computation, for want of more knowledge of the facts of the two cases, can only be suggestive; but the first-mentioned statements, that 80 tons of excellent green food have been raised from sewage containing £83 worth of fertilizers, and at Milan 22 tons from sewage containing £11 worth of fertilizers, are undoubted facts. The reason why I have gone into the question of the value of the ammonia, &c., in the manure will appear further on; for the present, I will proceed to answer the question of what the profits anticipated are.

If we take the Edinburgh returns as our guide, while it must be remembered that the evidence of those upon the spot is, that the utmost amount attainable has not been reached, but that the "fertility is invariably in proportion to the quantity of sewage used," and that the produce on the land in question will be as good as in the meadows in the north, some of which are upon "hard clay," some upon "sandy" land, and otherwise, and which is a point that can only be decided by trial, £30 or £40 may be expected for the crops of grass per annum. And at this price an immense sale may be anticipated in food for cows so near the metropolis, with a population fifteen times larger than that of Edinburgh; whilst at meat-feeding prices, which I purposely reduce to 5s. per ton, £20 per acre would be realized. The average may be taken at £30, and the amount stands as follows:

Value of grass		£30 0 0
Deduct annual rent and interest for capital laid out..............	£6 12 0	9 12 0
Fuel, labour, &c	2 0 0	
Superintendence and contingencies	1 0 0	
Clear profit....		£20 8 0

It is impossible to obtain such profits upon the system of jet and hose, or upon any other systems which have been brought forward. I am not inimical to the system of jet and hose for farms; but in farms the commercial points are quite different. Suffice it to say, that with reference to the hose and jet, according to the amount of several farms on which it is used, one ton is delivered for 2d. This is an expense irrespective of the rent of the land, outlay for pipes to convey to the farm the liquid, which, for the large quantity mentioned, namely, 10,000 tons, would, with rent and interest of about £6 added, be £89 per acre per annum; and if it be done for 1d. per ton, it will be £47; if at 0½d. per ton, £26 per acre. It is evident that with these charges there can be no comparison made with the system I propose, putting on this quantity at £3 12s. per acre, including interest, labour, and fuel, and which is more than in the case of the Edinburgh works. The water in the case of the hose and jet has to be pumped at a pressure to enable it to be projected to a considerable distance from the hose, otherwise the amount of pipes and hydrants would be increased to an almost infinite quantity, and the cost would be enormous. On the contrary, by the gravitation system, when water is pumped by the engine, the weight of the water only has to be lifted to the height required by pumping, at a pressure equal to a height not very much greater than that of the highest part of the land, and which is the point where the discharge of the water takes place from the end of the pipe leading from the engine. Also the amount of channels for its distribution is very great, and their combined area is very large in comparison with the area of one pipe of 3 inches diameter, which is the area for the water to pass with the hose and jet system.

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* When we consider that an application of 2 or 3 cwt. of artificial manure, costing about £2, or that 20 or 30 tons of farmyard manure, costing £4 or £5, is expensive manuring, how amazing does this £83 worth of manure upon one acre appear! No wonder that marvellous results are obtained, and have been maintained for more than half a century upon the same land.

While the evidence from various places of the cost at which the liquid is put on shows in one case that it is done at rather more than 0½d. per ton, at another at 1d., and by the greater number of farms at 2d. per ton, it can be shown by the practical rules used by hydraulic engineers, that for all farms contiguous to the rail, and such only at first would be contemplated, the water could be raised and distributed at 20 tons for 1d., including interest for engineers and machinery, and all labour and fuel (which charge, I may repeat, is more than is practically found necessary for the purpose at Edinburgh). There is also, however, the interest upon the pipe-works and gutters upon the ground to be considered, which if added makes the total cost 1d. for 14 tons.

The health of the inhabitants near or upon the works, is a question that used to be asked in reference to the propositions made at various times to follow the Edinboro' system, but this has been so completely negatived by the various competent authorities and medical men who have examined the question, either at Edinboro' or Milan, that I need not further allude to it. In the system I propose, as no amount at one time will be put on more than soaks away into the drains, and is at once pumped back into the sewers, there will be no water left standing on the surface. If, however, it should be asked whether, with the amount proposed, the water would percolate fast enough through a retentive soil, I need but say that in Mr. Bailey Denton's very valuable experiments at Hinxworth, carried on for twelve months, which land he purposely chose for his experiment, he tells us, because it was the stiffest land that he was acquainted with, and is styled in the report "very stiff clay, and impenetrable," a proof will be found for those who choose to study the subject, that no such fears need be anticipated with the amounts proposed. On one part of the estate the land had been drained 4 feet deep, 25 feet to 27 feet apart: another part of the estate was not drained. Test holes (or wells) were made in each, to see at what level the water always stood in the ground, and the amount of discharge from the drains registered. On January the 9th, there was no rain, the drains discharging 125 gallons per acre in the twenty-four hours, the water standing 4 feet 3 inches from the surface of the drained land, and 1 foot 3 inches from the surface in the undrained land. On the 10th it poured with rain, 12,200 gallons per acre in the twenty-four hours; immediately the drains discharged 5,150 gallons, and the water rose in the test holes to no higher a level than 4 feet from the surface; in the undrained field it rose to within 5 inches of the surface. On the 11th, it rained 6,780 gallon; it discharged 4,000 gallons. On the 12th, it rained 3,660 gallons; it discharged 1,990 gallons. On the 13th, there was no rain, the pipes discharged 1,250 gallons. On the 14th, the pipes discharged 600 gallons; on the 15th, 373 gallons; and continued daily at about that rate of discharge. The test holes during this time never *rose more than* 1 *inch above* 4 *feet in the drained land.* Here we see 12,200 gallons, or 50 tons, per acre, carried down at once to 4 feet from the surface, and the excess immediately passed away, and this in the middle of winter. Mr. Mechi often puts on 25,000 gallons, which is 100 tons, upon an acre in five hours; but the experiment of Mr. Bailey Denton in the winter, when the ground is not dry, is more valuable for our purpose. From these experiments it is quite plain, that the amount I should require to put upon an acre in the twenty-four hours would never stand upon the surface, while the soil proposed to be used is of a much more porous description.

It has been generally thought that if poor sandy land could be got, it would be profitable to carry out a system of irrigation with London sewage. I believe that the comparative increase of the value of the acre of land would be greater than with good alluvial soils, but I believe that the amount per acre of crop, or the amount of benefit that can be got out of a certain amount of sewage, will be greater with alluvial soils; and if this is true, it is valuable to remember it, because by far one of the greatest difficulties with reference to the application of the metropolitan sewage will be found to be the difficulty of getting a space *small* enough to get the most value out of the sewage. One has but to look at the Ordnance map to be convinced of this. The question will not occur then, how large a surface can we benefit at a small amount each acre, to gain a profit on the whole? thus giving ourselves an impracticable outlay of money to take pipes many miles into the country, till in fact we find ourselves in the district of arable land crops, to farmers who prefer valuable solid manure carted from London for little money, to weak liquid manure, which is suitable to hardly any of their crops, and which liquid manure is, on the other hand, good for grass just because it *is* weak, while also the mixture being weak the grass must have a large quantity to produce a large crop. In addition, it should be remembered, grass always holds a high value near a large town. It is necessary to retain these points in view by those who intend to consider the subject. There has been much harm done to the question, and calm consideration has been banished by the outrageous proposals of some men. One gentleman, whose pamphlet has been, I believe, most prominent, proposed 1,700,000 acres for the disposal of the sewage, or 2,734 square miles. The amount of pipes, the height to which the liquid was to be pumped, and the horse-power in engines, besides objectionable *reservoirs*, would in the annual charge for interest and cost for working the engines, have been stupendous. He proposed to charge every farmer £1 per acre, and to supply him with 50 tons of sewage, which at the full value, according to analysis, is only equal, at 2d. a ton, to 8s., while the farmer was, besides paying this, to be at all the cost of distributing the manure. The amount of capital required was stated at little less than 9,000,000 sterling. For the present requirements of the metropolis not one-hundreth part of the above land would be wanted to use the whole sewage of London. If we are content at present with thinking of absorbing only one-half of the 125,000,000 tons of sewage, which we shall have disposable per annum, 6,000 acres will be sufficient for the purpose. Now, this is a very attainable quantity of land, four thousand acres to the north of the Thames and two thousand to the south, might easily be obtained; and the amount of pipes and cost on account of the distance of any part of this surface would not be increased much beyond the original estimate which I have given, certainly not increased £2 per acre per annum. According to the amount (320 acres) now laid down in Edinboro', in proportion to its population, 4,500 acres bears the same proportion to London, and a high value doubtless would be obtained for the produce. If the six thousand acres are considered at the average returns over cost of production, which have been given, namely £20 per acre, we have a return of £120,000 per annum for an outlay of £90,000 upon the land, and it would not be difficult to extend the pipes lower down to take in the other 6,000 acres of land to exhaust the whole sewage of London. All such lands as are below the end of the main sewer would discharge the liquid drained from the farms into the Thames, only keeping it, as before stated, in pipes.

It will thus be evident that the greater value of keeping the whole upon as small a surface as possible is plain, and that, by what I have stated, an amount of land which will be sufficient for the purpose will be obtainable without difficulty. There are upon the district in question two men, who alone hold—one 1,200 acres, the other 800.

To come back to the question. It has been thought that a poor and sandy soil would be the best suited for the purpose. I have said that, *comparatively*, the value of sandy land may be increased more than good land. Poor sandy soil, worth before but little, may be so improved by it as to be worth a considerable price; but the profits per *acre* I believe will be much greater with good soils containing a sufficient amount of alluvial matter to retain the ammonia and other fertilizers in the liquid. It has been said that it has not been found to answer to use the liquid-manure of the farm upon the soil at Cirencester College, which is clay land. Now that, very possibly, is explained by Dr. Voelcker, in the last volume of the Royal Agricultural Society's *Journal*, where he says, in reference to the oxide of iron in the soil from Cirencester: "May not the oxide of iron, dissolved in considerable quantities from some soils through the agency of liquid-manure, be injurious to vegetation; and partly account for the failure that is experienced with liquid-manures on some soils?" Whether this be the reason or not, and if there be any connection between irrigation upon Italian rye-grass and other grasses, the evidence of Mr. Dickinson (who used it for fourteen years upon a stiff clay soil at Willesden) is in favour of clay soils. Moreover, he received a great number of reports from gentlemen who had irrigated Italian rye-grass upon various soils, and, from due consideration of their opinions, he places "clay upon clay," and "clay upon gravel," at the top of his list; placing loams next; and, lastly, sandy and poor lands, low down in the scale of soils adapted to irrigation. But what is more to the purpose is, that the oldest portion of the Edinburgh meadows for sewage is "hard clay." The difference is not always considered between *arable* clay land and *grass* clay land in this question. There is doubtless a very good objection to irrigating arable clay lands that require operations to be carried on upon them. From direct experiment it has been ascertained that clays and fertile soils take up much more ammonia, phosphate, potash, &c., from the liquid-manure than sandy soils do. The late experiments by Dr. Voelcker (detailed in the last number of the Royal Agricultural Society's *Journal*) are very interesting. As some other points will show themselves, from these I will give a few prominent facts, referring the reader, for the further detail of the experiments, to the *Journal.*

Dr. Voelcker took a sample of liquid-manure, which he applied to four samples of various sorts; he also took a sample of liquid-manure sent to him by Mr. Mechi, and applied it to a sample of Mr. Mechi's soil. The first-mentioned liquid-manure contained, in an imperial gallon, 35.58 grains, besides phosphoric acid, potash, &c., in certain quantities which I need not here detail. The soils, in the proportion of 2,000 to 7,000 grains of liquid, were mixed, left standing for periods of from one to three days, separated, and the liquid again analyzed, and the amount of various ingredients retained in the soil registered. The treatment of the liquid by the various soils is very different, and very interesting; but with regard to ammonia, and nearly also in respect to potash and phosphoric acid, those containing the most clay took up the most out of the liquid. The following table will show the proportion with respect to ammonia:

	Grains.	Grains.
Ammonia in one gallon of liquid-manure, provided by Dr. Voelcker	35.58	...
Calcareous stiff clay soil (clay 52, sand 24 per 100) takes up from the above	...	14.77
Clay pasture-land (clay 48, sand 36 per 100) takes up from the above	...	14.75
Fertile loam (clay 18, sand 76 per 100) takes up from the above	...	9.74
Poor sandy soil (clay 4·5, sand 89.6 per 100) takes up from the above	...	2.43
Ammonia in one gallon of liquid-manure, provided by Mr. Mechi	3.36	...
Mr. Mechi's very stiff clay soil; clay 76, sand 10 per 100, takes up from the liquid-manure provided by Mr. Mechi	...	1.81

Potash and phosphoric acid are also taken up in part by the soils, while part passes off in the liquid; but generally the clays have taken up more than the lighter soils of both of these.

Dr. Voelcker says: "It will be noticed that none of the four soils used in the experiments had the power of absorbing completely the whole of the ammonia, potash, or phosphoric acid contained in the liquid." I may, however, here draw attention to the fact that a little less than half the ammonia—about 3-7ths—has been taken up by the clay soils of Cirencester, and with Mr. Mechi's clay soil, with a solution very much weaker; so that there is only 1-10th of the ammonia in a gallon which there is contained in the other mixture. One-half, or rather a little more than one-half, namely 1.81 grain out of 3.36 grains, has been retained in the soil, the rest passing off in the liquid.

It would I think be an interesting question to solve what, in the use of large amounts of liquids in contact with soils, can be expected to be retained of the manure in those liquids; what the proportion of ammonia, &c., which is retained in the soil in the case of Edinburgh or Milan, by analysis of the liquid passed off as well as passed on to the land. Or would the vegetation on the ground produce a different effect to that produced by the plain soils unmixed with herbs in Dr. Voelcker's experiments? It is singular, too, that the money-value of the crops taken off fields largely irrigated, to which I first alluded, were also half of the money-value of the ammonia, &c, in the liquids passed through the land.

From these experiments I think it will be seen, if the land is so underdrained that the liquid readily percolates that from good soils, we shall get more than from poor sandy soils; and receive what we gain upon a more concentrated area.

It has been said that there is little value in sewage; that it is not much better than an equal amount of water. Now, this is true in respect to market-gardening and arable land crops; but is it true in respect to grass-land? It is said that in these large dosings of sewage for grass we should gain our advantage from the *water;* that water alone is known to produce upon some grass-lands very great effects, but that it depends upon the land suiting the water, or the water suiting the land. How do we know that land can take up in an available form such large quantities of ammonia, phosphates, &c., as to equal the value of £35 per acre, in one year, from a bulk of water containing £83's worth? I answer, that certainly very good effects have been produced by water; but that it has been proved that those waters had matters in suspension, or solution, of great value to the lands over which they passed. But I never heard of such great results from water-meadows as from those at Edinburgh. But to discover whether soil *can take up fully the amazing amounts stated*, let us examine a little further the experiments of Dr. Voelcker. His mixture contained in a gallon 35.58 grains of ammonia, besides potash, phosphoric acid, &c., and an amount of soil in the proportion of only one part in weight of soil to 3½ parts weight of liquid: namely, 2,000 grains of the soil to 7,000 grains of the liquid mixed together, and the soil retained 14.75 out of the 35.58 grains. To see how this fact stood in the matter of bulk as well as weight, and how much would have been retained in an acre of land, I had some ground carefully cut out from grass-land, to the depth of a foot, taken up and weighed. Excluding a quarter of an inch at the top (where the grass was), it weighed at the rate of 112 lbs. per cubic foot. I had it dried for two days, at a heat above boiling water, till it lost no more in weight, and I found that it had been reduced in weight to 86.2 lbs. Multiply 86.2 lbs. by 3½, and the result will be the weight of liquid-manure to put to it to equal Dr. Voelcker's experiment, the result will be 301 lbs. of liquid to 86.2 lbs. of soil, or to every foot of surface of land if the land is to be drenched to one foot deep. But I shall only consider that the top soil is the amount of soil that takes up the fertilizers from the liquid-manure; and if I consider this to be ten inches deep (if I take it deeper the argument is stronger in my favour), it will be seen that in round numbers one ton of liquid would be the quantity to each yard of surface; or, as there are 4,840 square yards to an acre, 4,840 tons of liquid would impart to an acre of land as large a proportion of ammonia, &c., as the 7,000 grains of liquid did to 2,000 grains of soil.

Without further detailing the calculation, it will be found that this amount of liquid would contain a value (at 35.6 grains to a gallon, and at 6d. per lb. for the ammonia, putting nothing down for the value of the phosphates, &c.) of £130; and the acre of land would retain (according to Dr. Voelcker's experiment, where 14.77 grains was extracted from the gallon) £55's worth of ammonia, besides other fertilizers. And this £55's worth of manure per acre is extracted in the one dosing from £130's worth in the liquid, in the space of time (whatever that is) that this quantity would have taken to pass through the soil. "Is this the utmost amount that the soil can hold at one time?"—Dr. Voelcker asks this question; but says that, at present, it cannot be answered. Would vegetation assimilate these fertilizers? Could another, or several more doses equal to this one, be given periodically, so that the acre of land should take up a yet larger quantity in the course of the year? Very likely the plants could not bear such large quantities of a liquid-manure of this strength; for the manure contains 6½d. worth of ammonia, besides other matters, in the ton, while the Edinburgh sewage has an amount of manuring matter in it of which ammonia, together with all other matters, is worth only 2d. per ton. That is not the question at present. The question is: whether land can take up the large quantities of ammonia, and other matters, out of the quantities I have at the commencement mentioned: namely, out of 10,000 tons, containing £83's worth, to retain and give out £32 or £35's worth; the land evidently *can do so*, and a very much larger quantity. Whether the crops obtain the chief advantage from the manure, when there *is* such a large amount of it, or from the water only, the marvellous amount of the crop is, I think, the best answer.

There is one point in these series of experiments rather singular: the liquid-manure sent by Mr. Mechi to Dr. Voelcker is exceedingly weak. It contains only 1-10th the amount of ammonia in the other samples used by Dr. Voelcker: in fact, it is weaker than London sewage.

I have not seen any explanation given in the *Journal* upon this point. Does Mr. Mechi really prefer so very weak a solution, or was it an accidental circumstance? I should like to ask Mr. Mechi if he finds that so weak a solution is the best for grass? If it be really true that such is the case, will it not be a reason against any attempt being made to separate the rainfall from the sewage proper which many have recommended, and also against the propositions to pass off (with or without deodorizing) the liquid part into the Thames, sending the remainder (the thick sludge) into the country, by pipes, for grass-lands?

I trust that, in the above, I have pointed out some facts worthy the consideration of those taking an interest in this subject; and that in the proposition of a plan for the application of the sewage of London, I have shown one which is both simple in its means of development and unprejudicial to the population, while it requires no adjuncts in the shape of large reservoirs for storing the sewage, or manufactories for deodorizing, and for separating the solid from the liquid part. And that to the public there would be the means of receiving back a very large annual sum, if it took the system into its own hands; or otherwise that a very profitable application of funds could be made by private or associated enterprize.

THE USES AND QUALITIES OF WATER FOR IRRIGATION.

The application of water for the purpose of irrigating grass land has at the present time a peculiar interest, arising from the fact that this is one of the most certain modes of ensuring the production of early spring food. It is one of the resources which we have at our disposal for producing fodder at a time of the year when it is especially valuable. Not that it is to be looked upon as superseding the cultivation of other crops which are of an established reputation, or even interfering with them, but rather as an additional means which we have easily within reach, in case of their failure or any deficiency in their produce. The possibility of being over-burthened with spring food is a position which will not excite the fears of any of our stock-farmers, whilst the satisfaction of a safe supply will prove a comfort to many. A peculiar succession of unfavourable circumstances have this season placed our supplies of roots in much danger, and a considerable quantity of food will have to be consumed rapidly, because of the injury the roots have received. This early consumption will seriously diminish the store for spring use, and food available for stock will consequently be of more than usual value to make up the deficiency. What has happened this season may happen again, and it is as well to consider each and every practice which is calculated to afford security for the future.

When water is available for irrigation, the first point for consideration is the suitability of the water for this use. In some districts the supply may receive matter from manufacturers' or other works, which will render it injurious to the land; but these are very exceptional cases, and preclude its being used upon the grass. The indications are generally tolerably clear as to this prejudicial character in the water, and any one who carefully watches the sides of the stream will soon have proof whether or not he must regard the liquid as unfit for use. These instances are, as we have said, comparatively rare, and bear only a very small proportion to the water which is of a valuable character.

One of the most generally accepted signs of quality is the warmth of the water. As a rule, spring water possesses this property; and when the spring is deep there is a considerable difference between the heat of it and the atmosphere, which confers upon the former an especial value. Some persons also depend much upon the softness of the water; but we are not disposed to go to the extreme into which this often leads them, because we know many instances in which hard water has been most satisfactorily employed. We are much more inclined to allow this point to be decided by local experiment; for it is by no means improbable that the hardness may be found objectionable on some soils, whilst other lands may correct this quality, and make use of the valuable properties without being prejudiced by its hardness.

Some streams are much more valuable than others, from the alkaline matters they contain; and where these are present even in a very small proportion, they give the water strong fertilizing properties. Their presence is, therefore, always looked upon as an indication of superior quality; but even in their absence the water is by no means to be considered only of small value. It is believed that when it contains no fertilizing matter (a circumstance of exceedingly rare occurrence), that still there is no mode of applying manure so economically as by its addition to the water which is going to be distributed over the land. The great point here gained is the extremely perfect apportioning of the manure; for whatever may be our individual opinions as to the value of homœopathic doses upon the animal system, it is undoubtedly a system which is suitable for vegetable nutrition; and in no instance have we clearer evidence upon this point than in the benefits arising from the infinitesimal quantities of manure present in some of our most valuable irrigating streams. We would therefore say, let not the poorness of the water be accepted as an argument against the possibility of its being applied usefully and economically.

The quantity of the supply is another important consideration; and this to a great extent controls the extent of land which can be watered. The plan on which the gutters are made will be found to make even greater difference, for some methods require a far larger supply of water than others. The most economical system for applying the water is that which has been so fully described in our leading agricultural journals as Bickfordizing. The benefits thus gained are a more perfect distribution of the water, by which a small supply is carried over a large extent of ground, and the more complete control of the water. These are advantages which are of especial value in the introduction of the system of watering land into those districts in which it has not already been adopted; and the general system is worthy of consideration, as a decided improvement upon the antiquated plans too often followed out, especially as it combines greater economy in the cost of formation, with superior results as regards the herbage.

It must, however, always be remembered that the distribution of the water is only a part of the preparation necessary, for unless the land is properly drained (either naturally or artificially), little benefit will be realized. We have reason to believe from the experiments of the late Mr. Pusey in Berkshire, and those carried out by enterprising agriculturists in other counties, that the formation of water meadows can be successfully carried out in many neighbourhoods in which their benefits are not at present known. If due caution is exercised great advantages will be gained, whilst the expenses incurred will be small, and the additional supply of food thus secured for stock will be an abundant reward for that judgment and enterprise which is at the present time so necessary for the promotion of agricultural practice.

ARTERIAL DRAINAGE.

The subject of arterial drainage and outfall, which was alluded to in our columns last week, and to which we promised to return, is necessarily of very general interest to many, nay, we may say to most landowners. Mr. Grantham commenced his paper by describing the general state of many important districts in which property to a large amount was rendered useless from the want of a proper system of arterial drainage, and of the improvement of the trunk lines or principal watercourses. The legal difficulties in the way of carrying out works of this character seem to call for some general legislative measure—such as Earl Carlisle's Bill, proposed in 1852, which in Mr. Grantham's opinion was the best that had been suggested—before the great object of improved arterial drainage and outfalls can be attempted on a comprehensive scale, or be effectively maintained in working order.

The subject was treated under the following heads: first, attention was called to some of the evils arising from the want of a combined system of operation; secondly, an account was given of the impediments which exist to prevent the adoption of arterial drainage; thirdly, the class of works necessary to be carried out was described; and, lastly, some of the leading principles in the construction of drainage works, to accomplish the object in view, were pointed out.

There is, perhaps, scarcely a district in this country where one of two conditions does not exist: either that the lands cannot be drained at all, or that they are injuriously affected by the drainage of those above them. The first of these cases is exemplified in those districts lying between the sources of streams, and extending for some distance towards the natural outfall, so that the owner of an estate, for instance, situated between those limits cannot legally straighten or deepen the stream or river running through that estate, and thereby drain his land, because he would, by so doing, inundate his neighbour's land lower down the stream; and in many cases one single person, who is unwilling to drain his property, may prevent any improvements by adjoining owners desirous and willing to improve theirs.

The subterranean or pipe drainage has not only been adopted as the first step in the improvement of land, but, from the vast benefit which has resulted where it has been applied, an enormous increase will undoubtedly take place; but this on its present scale, in addition to the field-drains and ditches being better cleared out, has already created a large addition to the water flowing down rivers, brooks, and minor streams, and the effect is that the water is discharged in a shorter time than formerly, and causes more frequent floods, the brooks and minor streams in numerous instances being now insufficient to convey away the larger quantities of water, which so suddenly flow down; and at other times the rivers and streams contain less water than formerly, in many cases not sufficient for the ordinary supply of the country, or of the towns which may be dependent upon them for supply.

To give some idea of the vast increased discharge of underground water of late years, the following particulars were stated by Mr. Grantham. About ten years ago power was given by Parliament to the Government to lend £4,000,000, under the sanction and control of the Inclosure Commissioners of England, for the purpose of the drainage of land, and erecting and repairing farm-buildings; and subsequently private drainage-companies have obtained powers to perform the same work, under the control of the same Commissioners. Up to this time there have been expended in subterranean-drainage alone, by this means, about £4,000,000, extending over 800,000 acres; and probably twice this amount has been laid out by the Crown, by corporate bodies, and by private individuals. There still remain large tracts of land that require to be drained; and from the beneficial effects produced hitherto, an annually-increasing extent will undergo the same treatment.

It may well be conceived that from the above number of acres alone the water that falls upon the surface can now be run off in the course of a few days to the arterial drains and outfalls, as compared with the slow trickling operation through the soil before the system of drainage was applied. How absolutely imperative it is that there should be ample provision made to carry off that water in the most direct and efficient manner; and in any works executed for that purpose, that there should be ample allowance given to meet a very much larger flow of water!

Another cause of the difficulty of draining land is the existence of mills, weirs, dams, and other obstructions in rivers, as well as their crooked and confined channels, all of which impound the waters upon the uplands, to the injury in some cases to twenty and even fifty-fold of the value of the mill or property maintained by the dams. Another question to be dealt with is, that the public roads cannot in all cases be interfered with, to admit of better outfalls; the existing culverts, or bridges, being rarely either sufficiently deep or capacious to admit of an arterial system of drainage being applied.

The other part of the subject, namely, the injury which lands suffer by being inundated by the drainage of the uplands, is as extensive as that alluded to in the former case, and is attributable to nearly the same causes—the want of combination among the possessors of property in executing land-drainage works, the vast expenses of which would otherwise be entailed upon single individuals so circumstanced; and in some cases the impossibility of forming sufficiently capacious channels and outfalls to carry off the surplus water; not to mention the hardship of one person improving his position at the expense and annoyance of another. This is strongly exemplified by the experience of the drainage of towns under the Public Health Act, where at the commencement no provision was made at the outfall for the disposal of the sewage; showing a want of forethought which should in future be avoided, before any general and complete system of land-drainage is undertaken.

The impediments which at present exist to prevent arterial drainage being carried out on a combined system, were attributed by Mr. Grantham mainly to the state of the law, which requires to be modified and changed, and its powers enlarged and liberalised. The law, as it at present stands, is totally unsuited to the existing and advancing state of society, and to the interests of the holders of property; for while it keeps one eye open, to jealously watch many unprofitable and useless rights and forms connected with property, it closely shuts the other against the wants and necessities it ought to assist and modify. The powers of the Legislature should aid the skill of the engineer; but the plans of the engineer are easy of execution, compared with the removal of the complications which are thrown over the whole question by the law; and these must be removed before any real good can be obtained. There have been a few attempts at legislating upon the subject, but most of them have been ill-designed and too feeble and timid to grasp at the whole question in an effectual manner. The best measure proposed was that of Lord Carlisle, in 1852, which, it is to be hoped, with additional powers, may yet be made to accomplish the great objects of improved drainage and outfalls.

The law at present stands in the way of arterial drainage being carried out in a combined and comprehensive system, by its not allowing a person to deal with his own property in this respect as he best can; nor is it sufficient to allow of certain things being done to facilitate such objects as would enable individuals or associated bodies to act for the good of all concerned. In fact, nothing can nor will be done effectually until this law is not merely modified and changed, but its powers enlarged and liberalised. The valuable paper of Mr. Grantham, and the subsequent discussions among the members of the Institution of Civil Engineers on several nights, open up a very wide field for inquiry and investigation.

A FEW WORDS UPON ARTERIAL DRAINAGE.

This subject is one of such great importance to every improver of British agriculture, that it cannot be too often brought before the agricultural public. It does seem very strange that a little island like Great Britain, with its innumerable bays, inlets and rivers, should be permitted to suffer so enormously from the overflowing of its rivers, its streams, and its brooks. It is very trying to the farmer who has spent a considerable sum in underdraining his farm, to find that, owing to various obstructions to the neighbouring brook, his lower lands are not benefited by his outlay; he proceeds to enquire the cause of this, and is told that the mill weir is so high, that the stream cannot pass off fast enough to take the water from the brook. He goes a little farther, and soon ascertains that the river by which his drainage works are impeded is so dammed by mills, mill-weirs, and bad bridges that his waters have no chance of passing away between one heavy rain-fall and another—that they are thus most abominably hindered in their passage to that great receptacle of all drainage waters, the sea. But, going a step further, he is still more surprised to find that, even if all these mills, weirs, and confined bridges were removed, the river is so tortuous in its course, so imperfectly cleansed, and so obstructed at its outfall into the sea, that he becomes confounded and almost in despair, returns declaiming against such injustice, and repenting that he had spent so much of his capital in vain. Now, this is the simplest case that can be brought forward, but it is a common one, a very common one, and as farmers desirous of improving our holdings, we ought one and all of us to exert ourselves to the utmost to have it done away with, to have the evil remedied.

Farmers are of all men the soonest reconciled to things as they are. We have had so little rainfall for the past five years, that we are inclined to think our climate has changed, and that St. Swithin has lost all his influence. Depend upon it, this is not the case, and I trust our farmers at least will not be found napping when floods do fall, but let every farm-drain be in order, however poorly the prospect of an outlet may be. It will ultimately find its way "somewhere," most probably to the injury of many ere it passes finally away. I repeat, that it does seem strange that our little island should have its rivers, all its rivers and water-courses so impeded. I can imagine the rivers of a vast continent causing impediments to drainage in the many districts through which they flow, in the immensity of their length; but that our tiny rivers, rivers whose length is scarcely perceived in the comparative mass, should thus be so obstructive, is totally at variance with good order and a nation's wealth. It might have been urged with some plausibility some years since, that this water as a driving power for mill machinery was very valuable; but what is it now? Why steam-power everywhere supersedes it. Rivers are no longer required as "forces" for mill machinery. Steam is better, more certain, and cheaper consequently. But the impediments thrown in the way by these mills and other obstructions cause the periodical flooding of immense tracts of very valuable land, and thus the commonwealth is injured. This probably calls more loudly for a remedy that the under-drainer is entitled to. I will state a few facts. In 1845, Cumberland and Westmoreland were visited by a tremendous flood, and again in 1852, doing immense damage. In 1853, South Wales was wofully damaged by the overflowing of its rivers. In 1852, the districts of the Severn and Wye suffered amazingly: in one small parish alone 2,000 sheep were washed away, from the impetuosity of the floods. All the vale of Gloucester was one wide-spreading sea, the tops of the trees alone being visible. In the same year (1852) the whole country suffered extremely. The central basin of Somersetshire—*i. e.*, the district included between Glastonbury, Wells, and Bridgwater—was under water. Sedgmoor was deeply flooded, and great damage done. The Valley of the Thames suffered wofully. "All the low lands for miles above and below Windsor Bridge were flooded several feet in depth." Oxford was standing in a sea of water, and all the lower country was under water from September, 1852, to February, 1853; the losses most disastrous, great numbers of families ruined. The Thame had 17 floods in 12 months from its choked condition. Hay harvests and corn harvests were washed away. In 1849, from the source of the Trent to its junction with the Humber it was one vast inland sea for the length of 150 miles, and occasionally stretching for miles on either side. In 1848 the midland counties suffered very much; and in 1849, 1852, and 1853 the valley of the Nene suffered from extraordinary floods. In 1853 the Essex valleys were in a most deplorable state; the hay all spoilt. I might go on enumerating, page after page indefinitely, all chiefly the result from river obstructions. The waters could not pass off with sufficient freedom. The consequence was a vast destruction of property; and as the same state of things now exist, it is most likely to occur again; indeed, it is perpetually recurring in a less degree. Now, what are the obstructions? Take the Nene; it has 33 mills in a length of 60 miles. A case is named in Dorsetshire where five mills stand as obstructions within the space of four miles. Other like instances are pretty general. Now, it has been fully proved that much of this damage may be prevented, if not all. The rivers, streams, brooks, and every watercourse of any moment, require to be placed under Government inspection, and a power given by one comprehensive Act of Parliament to deal with any manifest injury or obnoxious impediment. I like much both local government and local management; but I have seen so much of it with regard to drainage as connected with the Fens, that I would have something compulsory in the Act, provided a good case was made out, and the managers of a district refused to act or complete the improvement. Our rivers require deepening and straightening. I have not seen one that does not need this much, and I have seen most of them. The outfalls require improving no doubt, but if a more rapid and powerful stream is turned through them they will improve much by scouring.

I say, then, as a practical farmer, our improvements can never be consummated, or come to approach consummation, while such grievances and hindrances exist. Why is my occupation to be comparatively worthless because the waters are held up for my neighbours' advantage? Why, in these days of the wondrous railroad conveniences, are our rivers to be held up for navigable purposes? We live in stirring times, and we must keep pace with them. "All private interests must give way for the public good." Compensation is, however, generally, if not always, accorded to the sufferers; it is altogether contrary to British justice and British custom to do otherwise. I stay not to point out any course of procedure. We have numerous, I had almost said innumerable, Boards of one kind or another, any of which might be taken as a type for the formation of a commission for the improvement of the arterial drainage of the country. I heartily wish the noblemen, gentlemen, yeomen, and others comprising that body known as the "agricultural community," would at once take this question up, and deal with it as quickly and as justly as its importance demands.

BEEF *v.* MILK, BUTTER, AND CHEESE, *alias* THE CATTLE-FEEDER *v.* MILK AND DAIRYMEN.

Sir,—Common sense for profit has begun to call out far aloud, and wide, and wisely says the immense quantity o milk, butter, and cheese used in the metropolis and othe great towns yearly in the kingdom, ought to be forthwith taken into consideration, and not to be thrown upon the shelf for fat-fleshed beef, as if we entirely fed upon beef. Greater attention ought to have been, and ought in future, to be paid by the judges of breeding cattle in the quantity and value of the milk. The great milkmen in London have proved to their satisfaction that many of our close and highest bred animals are profitless in their hands, and when discovered, are sent to the fat market and sold as beef; the same has been done by dairymen of the greatest eminence. The never-to-be-forgotten in Smithfield, in the breed of cattle (I mean the real old English gentleman, Sir Charles Knightley), proved that like produced like. In his Durhams his great aim was a fine, firm, silky, grained marbled flesh. Sir Charles, undaunted, persevered until he obtained flesh equal to the best Scots upon short-horned cattle, which was said by his opponents never could be done.

Peterborough. Samuel Arnsby.

KENT v. SUSSEX—THE HOP DUTY.

There is a deal of stamina about the men of Kent and Sussex. They seem to possess to the utmost the national attribute of never knowing when they are beaten. Great is their reverence for beer, and incessant their efforts to have it fairly dealt with. They are continually holding meetings, and sending up deputations, with this one object. Now they are rousing the whole country for the repeal of the Malt-tax, and anon they have a consultation more confined to themselves, on the abolition of the Hop-duty. Every county member amongst them stands committed to these points, and every Chancellor of the Exchequer knows how often he will have to hear of them. If the Conservatives are in, they at any rate will do something for the relief of this great branch of the agricultural interest. Or, if it be the other side, for very consistency's sake, they must surely repeal here and abolish there, and carry their free-trade principles fully out. But should they not do so — if the petitioners get as little encouragement from one. Party as the other, it must not be assumed that they return home altogether dispirited, and out of heart and hope. On the contrary, they call another meeting the next week, and arrange for another deputation the next session. Further subscriptions are announced. Honourable gentlemen continue to be kept equally well-primed; while every public question, whether it be the outbreak in India, the increase in the Income Tax, a change in the Ministry, or another Reform Bill, is considered chiefly with a view to its probable effect on malt and hops.

Of course such an opportunity as the Emperor of the French's recent manifesto was not to be passed over, and accordingly a Meeting of the hop-growers of Kent has been held at Staplehurst. We were going to have free trade with France. The full measure of reciprocity was come at last. They would be able to send in their light wines duty free. The inevitable consequence, the natural sequitur, the grand climax to all this, is self-apparent in a moment. If we are going to drink foreign wines untaxed, surely we should have English beer on the same terms. If the principle is worth anything, let it be carried out. If you countenance free trade in beef and bread, perfect the system, and give it also in beer. Let there be no tax on the unmanufactured material of one or the other.

Unfortunately the men of Kent have scarcely come to this. When a much-enduring Minister has been baited by the hour together, when he has been told over and over again that this is a subject the Government *must* attend to, this a grievance that *shall* be remedied, some vehement orator goes a little too far, and the Right Honourable Gentleman is pounded no longer. He sees a weak place to creep through. He is much obliged—greatly edified—duly impressed—but still it would appear to him—the deputation will pardon him—but they hardly seem to have agreed amongst themselves as to what they really do want. And then he smiles blandly, and bows courteously, and is sure they will admit that, under the circumstances, he can say nothing as yet. The Private Secretary opportunely opens the door, the County Members have urgent engagements elsewhere, and the Influential Body fight it out in the street, or over an early dinner at the King's Arms, Westminster.

The hop-growers of Kent are just at present in something of this predicament. They do not want free-trade in hops after all. They are too stanch Conservatives for that. They only wish to have a remission of the war duty and the five per cent. Hops, in fact, are ticklish things to meddle with. There are people still who will tell you that in the best hop-producing districts they would rather the tax remain than not, and then go for the chance of a bad year. Indeed, it is an exciting business that sounds something like going on the Stock Exchange, or betting on the Derby, or working a mine, or becoming a railway shareholder. Still the opportunity was a good one. French wines are to come more and more into consumption here, simply from the duty being decreased. Then, say the hop-growers, do as much for us. We will not ask you to abolish the tax altogether, but reduce it. Of course the less there is to grant, the greater the probability of its being acceded. The hop-growers, then, offer to go for the repeal of the war duty—for "this and nothing more." They are very unanimous on the point. At least they are so in Kent, but alas! they are not so in Sussex. Some outrageous fellows there are, even now, contending for total repeal, thorough free-trade in hops and malt, and nothing less. What, then, is the moderate party in Kent to do? What can they say to Mr. Gladstone when he demonstrates that should he concede so much, their neighbours will be only clamorous for so much more?

The Meeting evidently felt the difficulty. Mr. Smith Marriott, the Chairman, said, "There was great unanimity among them last year; but he was sorry to say that this year they were not so unanimous, at least he judged so from what had been said in other places. He, however, trusted they would again meet each other; unanimity was highly necessary if they wished to get rid of a great injustice." He could only repeat this caution at a later period in his address:—"He hoped the planters would see the imperative necessity that existed for unanimity in opinion. If they were unanimous, there was some ground to hope for relief from a burthen that pressed most grievously upon the planter, upon the landlord, and lastly, but not least, upon the labourer, whose interests were of course identical with those of his employer." Then, Mr. Punnett, who followed, made special reference to the Mid-Kent planters, who were to a man in favour of the reduction of the war duty, and the penny per pound. *But* "their ardour in the cause was considerably lessened because of the recent meeting at Robertsbridge, where they were in favour of a free trade in hops; and it was that alone, in his opinion, that was the cause of their non-attendance that day. There were those Sussex men who were doing just as they did in 1859. They were going for free trade, which they agreed to give up when they had their large meeting, and agreed to merge all their private feelings, and to act together for the one common good; and it was consequently time for the men of Mid Kent to look out for themselves. He could not help considering it a great breach of faith on the part of the Sussex men. Let the planters go for one-half, and get it if they could, for in trying to get all they would have to put up with nothing. If they found their notions were wrong they could then go further, but not for free competition." Curious is it to those not thoroughly initiated in the mysteries of this trade to see how a partial remission of a burden is sought for, but how entire relief from it is to be avoided.

"We must not go for free trade," says Kent; and "We will go for free-trade," is the declaration of Sussex. The honourable member, who has to check the too-fond aspirations of his constituents, at once interferes. Nothing can come from his conducting them to Downing-street, as yet. Lord Holmesdale, who was present, said:—"They (the members for the county) must tell the right honourable gentleman that the planters of the two counties were unanimous in their opinion. If they could not say so, what could they do? What real service could they be? He thought that, before bringing the matter before the notice of Parliament, they should combine in the counties and send a joint memorial to the Chancellor of the Exchequer, who had to meet the whole of the financial burthens of the country." It is by no means an agreeable duty to tell our friends unpalatable truths. But such a meeting as that held at Staplehurst can do little good. If the hop-growers of Kent and Sussex are in earnest—if, as one gentleman said here, they must have some relief, or many of them will be ruined—they must go far more methodically to work. Hop-cultivation is but an exceptional thing, after all. The majority of farmers know but little about it, and perhaps care little more. The battle, then, has necessarily to be fought by a small band; and, if even this comes to internal disruption, with what hopes of success can the war be carried on? What are the differences between Kent and Sussex, and cannot they be privately arranged? Nothing tells so badly as any dissension in a Meeting got up for the furtherance of some especial object. It is true there was no actual division amongst those at Staplehurst, but continual reference was made to differences existing elsewhere. Let the Generals of these two forces meet, not necessarily in the open field, but rather for some quiet consultation amongst themselves. Let them determine, as the phrase is, what they do mean "to go for." Until then, numerously-attended public meetings will do quite as much harm as good. Reasonably argued and *strongly* put, the hop-growers have a case; but it depends entirely on themselves how much they make of it. Just now, those who would aid them can do little more than look on. The rest of the country is quite ready to move at the first favourable opening for a modification of both the Malt and Hop duties. But we must know what we are to ask for.

STEAM LABOUR.

[TRANSLATED FROM THE FRENCH OF THE "JOURNAL OF PRACTICAL AGRICULTURE."]

Everyone acknowledges that the spade culture is the best, and that the aratory instrument whose action approaches the nearest to that of the spade is the most advantageous to the cultivation of the soil. Well, what does the spade perform? First, it stirs the soil to a greater depth than the plough, and besides, it does not turn over the soil; or, at least, that is not the object proposed in working with the spade. Examine the work performed with the spade. It raises up with the blade of the instrument a portion of earth, which the workman most often throws forward without turning it over, by a simple movement of his hand drawn back, and which in falling breaks up; a few strokes with the flat of the spade finish what the shock alone was not able to accomplish. See, afterwards, with what care he collects the roots of the weeds, and throws them back into the trench, or else leaves them on the surface in small pieces, to be afterwards carried off and thrown into the dung pit. The gardener well knows that tillage, in order to be good, ought to be exclusive, and that wherever the parasitic plants grow in full freedom, and with their enormous power of multiplication, no harvest can prosper. See, afterwards, how the earth removed by the spade remains loose and spongy. There, no stamping of men and horses, no pressure of the plough soles upon the subsoil. What a contrast this mode of culture presents with that of the plough! The mouldboard, which seems to have been invented only to form the furrow, that sad and ruinous expedient of wet lands, and which drainage renders useless, turns over a band of earth compact and smooth, covering over the injurious herbs and their seeds a few inches only, which at the next ploughing reappear on the surface, to vegetate with more energy than ever. In shallow soils, and where the subsoil, by its mineral nature, cannot be brought to the surface, which occurs above all in the ferruginous lands, only shallow ploughing can be practised; and the subsoil, which may not be touched, remains impermeable. It is therefore natural to conclude that the plough is not the most perfect instrument for the preparation of the soil, and that, the necessity for the furrow no longer existing where drainage has rendered the soil permeable, the instrument which traces it becomes also useless with the furrow itself.

With an application, so beneficial, of steam to the traction of agricultural instruments across the soil, we may rationally aspire to a more perfect mode of preparing our land. This is what Mr. Smith has proposed, and which he has accomplished with such success, that he has a right to be proud of it.

Mr. Smith's farm contains nearly 40 hectares (or nearly 100 acres), and has only two horses, for which he has scarcely full employment; formerly he had six. Lord Hatherton, who has adopted Mr. Smith's system, has been enabled by it to save the labour of sixteen horses, with which he has dispensed since he employed the steam plough; and last year, at an agricultural meeting, he declared that the system had saved him at least 40 per cent. of his expenses of culture. Lastly, at another agricultural meeting, he repeated that assertion, corroborated by another year's experience. At Chester, a distinguished agriculturist, who himself also used Mr. Smith's apparatus, to which he had adapted a locomotive of eight-horse power which he already possessed, and which still served for the work of the grange, has assured us that he had been enabled to give up two teams of his horses, whose labour had become completely useless to him.

All this is as conclusive and decisive as possible. Nothing would be more idle or specious than to urge the cost of the machine against its adoption, for in reality it is much cheaper than it appears at first sight. The steam engines exist already on many farms, and those who possess them can easily apply them to cultivate by steam, according to Mr. Smith's system. They require only the grubbers, the windlass, and the cable of iron wire. Then, with regard to cost, what signifies the expense of the steam engine if, in spite of its comparatively high price, its use effects a saving in your expenses of 40 per cent! However small your occupation may be, you may realize in one year the value of your engines.

We have, however, examined into the practice of the agriculturists who have adopted the system of Mr. Smith, and there we have found that the results were still more conclusive, because the experiments were extended over entire farms, and had passed through all trials and surmounted all obstacles, encountered all the accidents of large farming upon every kind of soil, comprehending light sandy, mixed, and clay. We shall now consider steam culture in its advantages in respect to agricultural economy. We have begun with the practical, and shall now turn to the theory, which, in agriculture especially, is much more logical.

Amongst the great human industries there is none for which TIME is so precious an element as agriculture. It is the temperature and the vicissitudes of the atmosphere which frequently determine our ruin or prosperity. All practical agriculturists know that the whole labour of a week depends sometimes on a previous operation, which requires a day of drought or rain alone to accomplish. How many times are we not hindered from sowing our fields for want of favourable weather for doing the ploughing and preparing the land! and who of us has not many a time groaned at not being able to profit of a fine sunny day for want of a sufficient number of horses and men, when the next or the following day the uncertainty of the autumnal temperature brought back the rain and interrupted our too slow operations? How many times have not our harvests failed for not having been sown at a proper time? Well, with the steam plough all these fears and dangers and anxieties, which cause us to watch the direction of the wind, the form of the clouds, the cry of the birds, the setting and rising of the sun, the phases of the moon, &c., with all those anxious alternations of fear and hope—all this, we say, will no longer have any necessary existence. As the steamboat, impelled by its powerful screw, triumphs alike over the calm and the opposing winds, pursuing its course in spite of all obstacles, leaving very far behind it the unfortunate sailing ship enchained by the calm or thwarted by the currents and adverse winds, agriculture, when it shall have steam for its auxiliary, will be able from that time to free itself in some measure from the atmospheric vicissitudes, which, according as they are favourable or otherwise, accomplish his ruin or prosperity.

On clay soils half the harvest may be compromised, when the farmer is obliged to deposit the seed in a wet season by means of the slow labour of his horses. For example, suppose a farmer of 120 hectares, of which two-fifths are in wheat; the preparation of 50 hectares of wheat and 25 hectares of winter fallows by scarifying and cleaning will require the labour of twelve horses during at least forty-five days; then, by keeping count of other requirements of the working which demand the services of the teams, such as putting in the roots, potatoes, turnips, and beetroots, the delivery of the produce sold, the rainy days in which the team remain in the stable, we may reckon at least two months between the first sowings and the last. Everybody knows the inconveniences of a delay so much prolonged; for if, on one hand, we anticipate the commencement of the sowing, we are liable to the destruction of the too forward plants by the frosts of spring; and, on the other, if we are forced to sow too late, the winter frost comes to cut off the young plants too feeble to resist its attack, so that on either hand the agriculturist has everything to fear from the inevitable slowness of the means at his disposal. With the steam plough, which prepares the soil at the rate of from three to four hectares (7½ to 10 acres) per day, all these inconveniences disappear, and the operations which would have required the labour of twelve horses during sixty days, may very well be accomplished in half the time—say, thirty days. The six or seven horses remaining upon the farm, instead of twelve, will suffice to do all the accessory labour that the business of the farm may require. Besides, what obstacle can there be to the continuance of the work during the night, by means of lanterns, and relays of workmen? Steam has a long breath; with water and coal it never tires, and may very well work night and day. How many engines are there, the fires of which are never extinguished? There is therefore nothing extravagant in classing amongst the advantages of steam culture, that of being able to prolong during the night those operations for which a suitable time will have double importance and invaluable efficacy.

On this point, we are in some degree able to cite examples, for the steam plough has performed on many farms in England during the past season. The following is taken at hazard: Mr. Bird, of Lethywood, near Penkridge in Staffordshire, has been enabled to plough 29 hectares 40 ares (72a. 2r. 13p.) in fifteen days, during which they have made six transports of the apparatus, equivalent to three days' labour, some of the fields being far distant from the others. This gives 2 hectares 52 ares (about 6 acres 35 perches) per day, from seven o'clock in the morning to five at night, including half-an-hour for breakfast and an hour for dinner. To work this quantity of land in fifteen days would have required from twenty to twenty-four horses and five or six ploughs. At all events, with the number of horses usually employed on a farm of this importance, it would have required double the time—say, thirty days instead of fifteen. The sowing has therefore been advanced one-half, whilst the horses remained free, and have been employed with the harrows and drill whilst the steam machinery did the ploughing. The following is the calculation of the expenses for these fifteen days' work.

		fr.	c.
Three men and two boys, coal, oil, and fetching water		562	50
Taking machinery from one field to another..		22	50
20 per cent. interest and dilapidation of machinery	10f. 500c.		
Calculation of 200 days' labour of the machine	10 500		
	21 000		
		315	00
		900	00

This gives 30 fr. 60 c. per hectare, or about 10s. 2d. per acre. The same work done by horses would have cost at least 45 fr. or 15s. per acre, without reckoning the delay of fifteen days in the sowing.

Mr. Redman, of Overton, near Swindon, has ploughed 63 hectares in 35 days with Fowler's plough, at an expense of 24 fr. 75 c. per hectare, or about 10s. per acre. F. Robiou de la Trehonnais.

LICE ON CALVES.—A number of years ago I had a yearling that grew poor, and I could not help it. Its breathing became so loud that it could be heard several rods. I thought it would die. One of my neighbours told me that he had heard that sour buttermilk was good. I procured some, and washed it from head to foot; and in three days his breathing was very regular, and he was as smart as need be. I had no more trouble with him.—*Rural New-Yorker.*

HIGH FARMING WITH PROFIT.

BY ALEXANDER SIMPSON, TEAWIG, BEAULY.

[*Premium—The Gold Medal.*]

In presenting the report contained in the following pages, the writer is not prepared to say that its contents elucidate (in the words of the Society's "Premium List") "the *best* mode;" he is satisfied with offering a report describing *a* "mode of managing a farm, affording an example of high farming combined with profit."

To entitle a report on this subject to consideration and confidence, I believe that what is required is not an estimate of *probable* returns from *supposed* expenditure (these, when tested by experience, almost always prove fallacious), but a *bona fide* return of the expenditure and receipts of a farm in working order. This I give in a form which I conceive will be intelligible to the reader least conversant with book-keeping, while I believe it will be received by those versed in figures as a fair business statement of the accounts of a tenant-farmer. As such, indeed, I confidently present it. Not unacquainted with business prior to engaging in my present occupation, I keep regular accounts as a matter essential to farming as to every other business; and the profit-and-loss account is simply a transcript of my own books, with the exception of one entry which I have, for reasons fully explained, amended.

The accounts given are those for the crops of 1856 and 1857. Situated as my farm is, on the north-eastern coast of Scotland, I shared fully in the disasters attending the harvests of those years—which will long live in the memory of Scotch farmers. Much corn was totally lost by the opening up on the fields of the drenched stooks, more was deteriorated to a large degree by discolouration and sprouting; while the harvest work being protracted, was necessarily expensive. The potato disease was also very destructive in its effects during both years. An exposition of the results of these two years is, I feel, putting profitable farming to a most severe test—a test which, perhaps, in general it could not stand, and which, in my own case, it does stand only from my following a more diversified system of cropping than that afforded by the standard four or five-course shift.

The total acreage on which I report is 313; of these, four are occupied by houses and buildings, and ten by banks and belts of plantation not capable of cultivation, and of little or no value for pasturage, leaving 299 acres of arable land, which were cropped as follows in the years 1856 and 1857:—

	1856. Acres.	1857. Acres.
Wheat	69	82
Barley	39	12
Oats	32	50
Total cereals........	140	144
Beans	0	5
Potatoes	24	27
Ditto for cottars, &c.	3	2½
Mangold	0	1½
Turnips	57	38
Turnips sown for seeding	5	14
Turnipseed..	0	5
Fallow after turnipseed	8	0
Tares for cutting	0	2
Grass in rotation	54	53
Grass in permanent calf, &c., parks	5	5
End ridges, and uncropped ..	3	2
	299	299

The expenditure and returns for the crops of these years are given in the following account current:—

CROPS 1856 AND 1857.

DR. FARM.

1856. June 1.	To valuation of live stock, viz.,						
	Horses	£262	0	0			
	Cattle	352	10	0			
	Sheep	134	15	0			
	Pigs	36	0	0	£785	5	0
1858. June 1.	To purchases of horses	£98	15	0			
	Cattle	137	5	0			
	Sheep	100	19	9			
	Pigs	8	14	0	345	13	9
	To cattle-feeding stuffs purchased				97	13	8
	To general farm expenditure for two crops under the following heads, viz.:						
	Rental	£975	7	2			
	Rates and assurances ..	43	1	10			
	Yearly servants' wages ..	240	8	0			
	Ditto provisions ..	308	15	2			
	Labour by outworkers ..	370	15	0			
	Seeds of all descriptions ..	500	11	0			
	Manures	413	16	9			
	Bran, &c., for horses* ..	71	12	0			
	Tradesmen and charges ..	215	19	5			
	Implements purchased ..	56	4	9			
	Improvements, and lime ..	130	2	10	3,326	13	11
	To 2-11ths of expense of improvements of thrashing-mill in 1856				9	12	3
	To crop 1858—Rental and charges on 14 acres turnipseed, harvested July, 1858, proceeds to crop 1857				35	0	0
					£4,599	18	7
	To balance, being profit on the investment, including interest on capital				548	16	2
					£5,148	14	9

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* This head does not include home-grown corn used for horses. Bran is used to a large extent as food for the working horses. The lighter oats go for feeds when at full work, and tail barley and wheat for boiled messes. On these, and the grass, tares, and hay used, it would be difficult to set a value; indeed, practically, it would be difficult to give an exact account of the quantities consumed: and as they are used up in working the farm, an account of them would only be useful to show the gross produce, but would not in any way affect the balance-sheet.

CROPS IN 1856 AND 1857.

	CR. CONTRA.					
1858.						
June 1.	By cash sales during two years—of					
	Cattle	£412	9	1		
	Sheep	224	8	1		
	Pigs	138	9	2		
	Total live stock ..				775	6	4
	Wheat	984	18	10			
	Barley	478	4	9			
	Oats	269	2	3			
	Total corn ..				1,732	5	10
	Potatoes	457	1	1			
	Turnips to sheep ..	133	6	10			
	Turnipseed.. ..	337	10	10			
	Grass, hay, &c. ..	40	7	9			
	Dairy of 12 cows ..	122	11	9			
	Total green crop..				1,090	18	3
	Total cash sales ..				£3,598	10	5
	By corn, &c., &c., used for servants' provisions and household supplies,* under the following heads, viz.:						
	Wheat	164	12	3			
	Barley	13	8	9			
	Oats	202	6	10			
	Beans and tares	6	17	6			
	Potatoes	159	3	8			
	Turnipseed, and rent of land occupied by	32	8	0			
	Rye-grass-seed	10	14	0			
	Dairy	63	3	4			
					652	14	4
	By valuation of live stock, viz.:						
	Horses	320	0	0			
	Cattle	410	0	0			
	Sheep	140	0	0			
	Pigs	27	10	0			
					897	10	0
					£5,148	14	9

The foregoing account might be epitomised as follows:—

CROPS 1857 AND 1857.

DR. FARM.						
To ordinary expenditure for two years, as follows, viz.:						
Rental, rates, &c... ..	£1,018	9	0			
Labour, tradesmen, and charge	1,135	17	7			
Seeds	500	11	0			
Manures	413	16	9			
Depreciation in value of, and food bought for horses	112	7	0			
				£3,181	1	4
To extraordinary expenditure, viz.:						
Implements	65	17	0			
Improvements, and lime ..	130	2	10			
				195	19	10
Total expenditure..				£3,377	1	2
To balance for profit and interest.. ...				548	16	2
				£3,925	17	4

CROPS 1856 AND 1857.

CR. CONTRA.						
By produce for two crops of—						
Wheat	£1,149	11	1			
Barley	491	13	6			
Oats (besides horse-corn) ..	471	9	1			
Total cereals				2,112	13	8
Beans, hay, &c.	57	19	3			
Turnips to sheep	133	6	10			
Potatoes	616	4	9			
Turnipseed	334	18	10			
Profit on live stock (deducting purchase for food) ..	670	14	0			
Total grass and green-crop land				1,813	3	8
Total returns				£3,925	17	4

The purchased manures amount to 14s. per arable acre per annum. Including purchased feeding stuffs, the expenditure amounts to within a fraction of 20s. per arable acre per annum.

This is a rate of expenditure which may fairly be held to characterize a system of "high farming;" and the writer is rather inclined to exceed than to fall short of a similar liberal expenditure in future years.

	Per Acre per Annum.		
The gross returns are..	£6	11	3
The rental is (which, when the soil, &c., are taken into account, will be considered a high rate)	1	12	7
The residue to the tenant is	0	18	4

The foregoing accounts are not accounts "cooked" for the occasion, but, as has been already stated, are faithfully taken from the business books of the farm, and were kept without any view to their condensation into a published statement.

Having thus given, in accordance with the requirements of the Society, an account of "*the expenditure and returns*" of the farm reported on, I now proceed to explain, also in accordance with those requirements, "*the mode of accounting*" which I follow.

It is very simple. The term of old Whitsunday (for convenience say 1st June) is the time of balancing the year's accounts. By this time the corn of the past season is all thrashed, and either sold or in granary. It is not valued over to the next crop, the actual returns when sold being the credit to the crop it belongs to. The winter stock of cattle, sheep, &c., are then either sold, or valued and turned over to summer grazing.

The seed-corn, &c., sown, is credited to the past, and charged to the incoming year at its fair value, as will be seen at the debit and credit of the foregoing balance-sheet.

The farm-work performed, the manure and straw are not brought into account. Transferring accounts of tillage, &c., from one year to another, is an unnecessary complication, as there can be very little difference between one year and another, under one system of management; and the valuing of ploughings, cross ploughings, harrowings, and grubbings, only serves to confuse and mislead, except in the case of a change of tenancy. In like manner the stock of straw and manure, at any particular period, varies but little from year to year.

Implements also do not require to be annually valued; for it will be found that, to keep up with the improvements of the day, new purchases must be made to an extent sufficient at least to balance any per-centage that would be required for deterioration on the old stock. It will be observed that £56 4s. 9d. were thus expended during the two years reported on; and here it may be observed, that, so strictly had this rule been observed, that an amount of £52 18s. 6d., paid for attaching horse-power machinery to the water-thrashing mill, was charged against the then current year (1856); but on further consideration it appeared but right that this charge should be spread over eleven years—the unexpired term of the lease—any sum to be received at its termination for the machinery being considered as equivalent to the compound interest on the expenditure.

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* The total amount included under the head "Household supplies" does not exceed £50 in two years, so no great error in over-estimation can have been made. The provisions used in kitchen are all charged to "servants' provisions," per contra; and the portion used by the female servants is considered to meet the value of their services in dairy-work, their money-wages going in cash-book to the account of "household and personal expenditure."

Improvements effected during the year are also put down to current expenditure—not capitalised. Such will, in the ordinary operations of a farmer, be found necessary in the way of additional draining, or making up defects in that already executed, and in additions to, or alterations in, office-houses. These *ought* to be done by the landlord, but practically, during the currency of a lease, they generally fall on the tenant. For such, and for the improvement of the land by liming, it will be seen that a charge of £65 per annum has been incurred.

There remains to be noticed the valuation of live stock.

Horses may in some sense be considered as part of the outfit of the farm, and might be classed as part of the "Capital Account." But considering that, on the one hand, deterioration by age necessarily does occur, and that considerable deterioration may take place from accident or disease; and, on the other hand, that by rearing young horses the value may increase, instead of diminishing, from year to year, irrespective of purchases made, it becomes necessary to re-value them at stock-taking, in the usual way, before striking a balance.

In regard to the other descriptions of live stock, there can, of course, be no question as to that being the plan to be followed. In affixing a value to the live stock, every care has been taken to arrive at a fair value; and as the foregoing accounts were made up for private use, and not for publication, there could be no object but to make them as accurate in this respect as the judgment of the writer would allow, without calling in the assistance of others. When the valuation is made, he has as clearly in his view the profit-and-loss account of the crop growing as of that closing, and hence the scales are held equal. In the employment of valuators the same knowledge of the stock, its capabilities or antecedents, could not be expected—the same individual could not always be secured, and difference of judgment, caprice, or inattention, might occasion discrepancies in valuation which would be very embarrassing to one keeping accounts, as has here been done, not with a view to publication, but for his own information and guidance.

It is, doubtless, somewhat bold in a tenant-farmer, of whose lease a considerable portion has expired, thus to come forward with not only the statistics of his occupancy, but also with full details of its money results. I believe, however, that by the close and jealous reserve generally observed by those of my profession in this last respect, a great deal of misapprehension is occasioned. I believe that landowners are more disposed to over-estimate than to under-estimate the profits of farming. The figures given above can do no harm in our relations with them; they show, as will be seen hereafter, but a very moderate per-centage on capital invested. Again, tenant-farmers, from the want of keeping accounts, are apt to under-estimate their profits. Because the "balance in the banker's" is not increased from year to year they are apt to conclude and to assert that "farming is a losing business," although in the mean time their personal and household expenses have been defrayed, and in most cases a progressive improvement has gone on in the value of their stock and condition of their occupancies.

But it may be said that I have not given a fair view of the results obtained by myself, and therefore no correct *data* for estimating those of others, from having selected as my years of exposition two in which bad harvests were experienced. But here there were compensating influences at work. "Necessity is," proverbially, "the mother of invention;" and the urgency of rent-day, and labour and manure-bills, causes expedients to be resorted to, which, in more prosperous times, would not be thought of, or, if thought of, put aside as "troublesome." Thus, sprouted grain may put pigs more forward in the balance-sheet than they would otherwise have been; damaged straw may cause the opinion that cattle will not make much of the turnips to be given in connection with it, and these turnips may be turned to an account in raising turnip-seed, which tells in the balance-sheet, and at the factor's audit; a failure in the potato crop may make a particular variety, which has comparatively escaped, a matter of profit from seed demand, considerably beyond the ordinary rate. So important were those influences in the years reported on, that I believe I would not be safe in calculating for future crops—exempt from harvest disasters and potato failure—a much larger balance to the credit of the profit-and-loss account than has been given above; a balance which, as already stated, will be found a very moderate return on capital invested.

This brings me to consider at what that *capital* should be stated. Here I am free to confess that I experience much difficulty. As will be understood from a description of the land I occupy, to be given hereafter, a large proportion of it was entered upon when it was in the very lowest state of exhaustion. Much work, in the shape of permanent improvement, was executed in the way of draining, building office-houses, &c. Thus it was at least a full rotation before the land was even in fair working order. During this period the "capital account" could not, of course, be closed; and when these derangements were put right, and fair working condition arrived at, the intricate question presents itself, "When profit on capital should commence to be computed?" If from the beginning of the investment or adventure, profit were to be added to capital, then too heavy an enhancement would be made of the "Capital Account." Moreover, impartial reconsideration of past expenditure might show that a good share of it was chargeable rather to "*inexperience*" than to "*capital.*" To disentangle these two items would be a task puzzling to the best farmer-accountant, and I shall not undertake it. I believe that a fair valuation of the farming investment, as it now (October, 1858) stands, is the most correct view of the "Capital Account" on which profit is computable; and I may add that, assuming the following to be a correct view of the immediately available value of the investment—which I believe it to be—the investment has, on the whole, turned out very fairly as to the past.

ESTIMATE OF FARM VALUATION, OCTOBER, 1858.

Live stock as at 1st June, 1858	£897	10	0
Increased value thereof, from pasturage to date	100	0	0
Implements and mill machinery	400	0	0
120 acres corn crop, average per acre £8	960	0	0
25 acres potatoes and winter beans, per acre £15	375	0	0
6 acres mangold, per acre £10	60	0	0
42 acres swede and yellow turnips, per acre £8	336	0	0
12 acres turnip seed, contract	200	0	0
Hay Stacks, 30 tons £3	90	0	0
	£3418	10	0

This is an "above-ground" valuation. An "under-ground" valuation of unexhausted manures and improvements might be entered upon; but it would be at the best but suppositive, and dependent on unknown conditions of prices. I shall therefore not add it to capital; though assuredly I would not part with it at less than one thousand pounds.

Assuming, therefore, that the "Capital Account" stands at the above sum of £3,418 10s., the profit for two years appearing as £548 16s. 2d.—*i. e.* £274 8s. 1d. per annum—I have an annual return for superintendence, risk, and interest, of *eight per cent.*

This is not equal to the profit expected on capital employed in mercantile transactions, where 10 per cent. is calculated upon as the fair return upon capital invested. But a farmer is engaged in what has well been termed by the wise and great Washington "the most healthful, the most useful, and the most noble employment of man;" he should, therefore, be satisfied with a less annual return upon his capital than is reaped (or expected to be reaped) by his friend who, "in populous cities pent," passes his anxious days in the whirl of commerce. He has, moreover, this to counterbalance his more moderate profits, that he has a house and garden rent free, and also a horse and vehicle, which, occasionally employed as part of his business outfit, is at all times a matter of personal and family accommodation, which, to commercial classes, it would cost a portion of their "profits from trade" to obtain.

DESCRIPTION OF THE FARM.

It lies on the eastern side of Scotland, in the valley of the Beauly Frith, and on the confines of the counties of Inverness and Ross.

It consists of two separate holdings, of the respective sizes of 180 and 119 acres. They are both held under current leases of 19 years' duration. They are situated at rather more than two miles' distance from each other, and have separate steadings and resident servants; but are practically worked as one farm. Horses and servants are transferred between them as the arrangement of work may require; stock also, as the consumption of grass and winter food may determine.

There are advantages, and also disadvantages, connected with this division of the land. The first are, the less length of the cartage between the fields and the steadings—the moderate size of the fields, averaging 18 acres each—and some emulation between the resident servants at each. The disadvantages consist chiefly in the dislocation of work, by the ordinary carrying on of it by two small parties instead of one larger united band. On the whole, I think that, by it tne item of labour in the expense account is somewhat increased, while the horsework is economised: thus the advantages and disadvantages about counterbalance each other.

To the holding of 119 acres, situated at about 20 feet elevation above the sea-level, having the river Beauly as its southern boundary, the following description and remarks, forming part of a contribution on the subject of "Draining' to the columns of the *Agricultural Gazette* in 1855, apply:—

"A specimen of the soil and subsoil having been submitted in the year 1845 to Professor Johnston, he furnished the following analysis, appending thereto some valuable remarks and instructions (partially quoted below), which have been of much service in directing the processes of culture and management followed out. Analysis of—

	Soil.	Subsoil.
By Washing—		
Clay, fine sand, and organic matter..	93.07	97.12
Coarse sand and small stones	6.93	2.88
By Analysis—		
Organic matter	10.10	2.44
Alkaline salts, soluble in water	0.91	0.15
Gypsum, sulphate of lime..........	0.19	Trace.
Oxide of iron	3.32	3.70
Alumina, soluble in acids	2.13	2.41
Carbonate of lime	1.32	0.47
Carbonate of magnesia	0.87	0.61
Insoluble silicious matter..........	81.17	88.25
	100.00	98.03

"'*Remarks.*—It is a stiff clay soil, formed, as your geological position would intimate, from the *debris* of the mica-slate-rock, with a little assistance from the granite and old red sandstone. The proportion of oxide of iron, derived chiefly from the latter, is not excessive; and in a proper condition of the soil, properly drained, thoroughly opened, and well tilled, would add to its productive character. But I observe that this oxide has formed itself into little lumps, indicating an unwholesome condition of the soil—that the air is not properly admitted, and that there exist among the soil particles of ochrey matter with which it will not be wholesome for the roots of plants to come in contact. The small quantity of organic matter in the subsoil would seem to imply that it has been hitherto in a condition in which very few roots would willingly descend into it. These facts all recommend thorough drainage and subsoiling as necessary to render available to the plant the different kinds of food which the soil so abundantly contains.'

"These remarks were written in July 1845. Perhaps their accuracy could not be better supported than by the simple statement that the wheat crop of the outgoing tenant for that year was estimated by valuators at 14½ bushels per acre; an estimate which was somewhat in excess of the produce actually harvested by me, the incoming tenant. The whole farm has been thoroughly drained, and the effects are very satisfactory—the produce being now in the aggregate fully threefold of what it was prior to draining and deep tillage, though the ochery matter which the learned Professor described as 'not wholesome for the roots of plants to come in contact with,' is not yet quite washed out or neutralised: hence the produce of wheat and oats disappoints expectation, while green crops are satisfactory.

"When I began draining, Smith of Deanston's system of furrow draining was beginning to be accepted by the more advanced agriculturists as a proved and practicable improvement; and his plan of 2½-feet drains filled for a foot with broken stones, was the perfection of drainage engineering. Such was the system followed in the major part of the drainage I effected. My first change was to 3 feet depth with 8 inches of broken stones; then came tiles with boards below for soles, and broken stones above. It was in 1848 that I put down the first pipe-tiles, 3 feet deep. Increasing that depth to 3½ feet, and placing 1½-inch pipe drains in the line of greatest descent at intervals of 8 yards, we attain to what may well and truly be termed 'thorough drainage.'

"Drainage on each of these systems has, I must say, been efficacious, whatever preference I may give to one system over another. No water, even after heavy rain, lies for above a few hours on the least perfectly drained field. It is true that the run through the stone drains is not so rapid as it is through tiles, but those who have scanned the results obtained by one of the most skilful and successful of Scottish agriculturists, Mr. Hope, of Fenton Barns—which are largest from land drained on what the enthusiasts for deep draining would consider very faulty principles—are cautious about trying to 'make good better' by going again over their drained ground; therefore I am content to allow my land stone-drained, at 2½ and 3 feet depth, to lie as it is."

On this holding the work done on or to the land has been furrow-draining, as above described; the building with stone conduits, and filling up of upwards of 2000 yards of wide open ditches; the levelling of old fences and grubbing up of thickets, which formerly rendered useless 5 acres of ground, and impeded the straight working of the fields. These labours cost about £600 for hired labour, besides much work by the servants and horses of the farm; a part—£375—of this was money obtained by the landlord's co-operation, under the Government Drainage Loan Act, for which the full interest of 6½ per cent. is paid by me, and classed in the accounts under the head of rental. Subsoiling; the use of lime, pure and in composts (principally the latter); the application of guano and other portable manures, are the further means used in each year for the improvement of the soil of this holding, BUT IT CONTINUES A DEAF SOIL. Iron is still abundant "in an unwholesome condition," and practical farmers know well that such a soil is more productive of straw and weeds than of corn.

A steading, including water-power mill and mill-dam, was erected by me at my own expense, with the exception that wood and slates were furnished by the landlord. This, with the refitting of the dwelling-house, also done by me, cost little less than £500.

Of the other holding, 120 acres are in a flat, reclaimed by embankment from the Frith. All this land is below the level of high water. The drainage water is collected in open ditches surrounding and intersecting the flat, and discharged at low water by sluices through the embankment. When the land was reclaimed about thirty years ago, it was a perfect swamp, not merely from the influence of overlying water from tides, but also from spring-water; for, lying as it does immediately at the foot of a gravelly terrace of land extending back for several miles without any natural drainage outlet, the water of filtration through this large extent rises to the surface through the flat. This rising water was originally taken from the fields into the surrounding ditches by drains formed of brushwood. These, of course, soon decayed, and were replaced by drains formed either of stones from the gravel, three to six inches in diameter, or of split trees laid triangularly together. These, again, became unsatisfactory, and are still the cause of much annoyance from frequently bursting out. Since the commencement of the present lease, the land has been gone over again, and £394 advanced by the landlord (interest on this at 6½ per cent. is also paid and included in the rental charge) has been expended in thorough pipe drainage—the leading drains being constructed of stones, the rejected cuttings of a large red sandstone quarry in the immediate neighbourhood. The outfall is so defective, even at low water, that three feet is the utmost depth that can be attained, and there is expense continually incurred by the silting up of the pipes and the breaking out of the old wooden drains. The containing ditches are also difficult to keep clean, as the current is very languid, and water-weeds grow rapidly and choke them.

This flat is of a peaty soil, lying on a subsoil of bluish alluvial sand, with occasional veins of diluvial clay through it; and it also is charged with an unwelcome superfluity of ochrey matter, giving it a similar character to the previous division—namely, that of "*a deaf soil.*"

The other 60 acres of this holding are on the gravel terrace, about 40 feet above high water mark. They consist of thin sharp soil, giving good returns in "dropping years," but easily affected by drought and overworking.

The buildings on this holding, including water-power mill, were completed by the landlord, and are on the whole commodious, though they have required changes at the tenant's expense (witness £52 18s. 6d. for horse-power machinery to mill) to suit them to his requirements.

MANAGEMENT.

The two divisions of 120 acres each are managed on a six-course shift, say—

1. Grass.
2. Oats.
3. Green crop: potatoes, beans, swedes, mangolds.
4. Wheat.
5. Turnips.
6. Barley or wheat: sown out with grass.

It is a rule to give a heavy farmyard manuring to No. 3 of the course, supplemented by guano or a mixture of it with dissolved bones. By the aid of composts more or less of No. 5 is gone over with manure, and it receives a liberal supply of portable manures in the turnip drills. If wheat follows, that is put down with as much farm manure as can be gathered together in the autumn.

The terrace or gravel land is managed on a five-course shift—

1, 2. Grass pastured.
3. Oats.
4. Potatoes, or turnips eaten off by sheep.
5. Barley.

This is a hungry soil, and swallows up much farmyard manure without making much return for it. Dissolved bones are most relied on for its fructification.

The above is the general course of management, but some derangement in its rotation has been caused (as will be seen by the acreage cropping previously alluded to) by the practice recently followed of raising some acres of turnip seed on a contract with respectable seedsmen. That practice also involves, to some extent, the curtailment of the live stock, and a consequent increase in the manure account. In other respects I do not think it involves impoverishment of the soil. The land in the end of July is in your hands free of crop; and that crop, as carried away, has consisted of—say 12 cwt. of seed for two years' growth. To restore the constituents of that by farmyard or artificial manure is no difficult task. You have the land cleaned and manured before the commencement of harvest work, with the rotation, as it were, at your command, to begin with wheat or whatever other crop you please. I have found it advantageous on clay soil to follow a crop of turnip seed by one of winter beans. These can be sown in early autumn, so as to have well-established roots before winter sets in, and thus they ripen in July or August, and are not troublesome and precarious to harvest, as are spring-sown beans in late seasons.

The portable manures used during 1856 and 1857 consisted almost entirely of first-class Peruvian guano, and bones dissolved by myself in sulphuric acid. The quantities used were—

	1856.	1857.
Guano—cwt....................	230	76
Bones for dissolving—bushels	252	668

It will be seen by this statement that the extravagant price put upon Peruvian guano has much limited my use of it. If sold at £10 to £11 per ton, I would use it to the extent of 4-5ths of my expenditure, as there can be no question that it approaches nearer to a perfect manure—*i. e.*, one available for every crop and every soil—than any other.

The live stock on the farm as now (October 1858) settled for the winter, consists of—

13 Cows (crosses).
1 Short-horn bull.
12 Two-year-old cattle for feeding.
13 One-year-old do.
12 Calves of this year.
90 Ewes and 2 Leicester tups for early lambs to sell off.
30 Half-bred lambs to fill up stock.
1 Boar and 3 breeding sows, with their last and present litters.

About eight acres of turnip will be let for sheep-feeding. This is not a paying practice, giving usually less than £6 per acre; but it sweetens and improves the ground when practised once in each second rotation, *i. e.*, in each ten or twelve years.

The labour is performed by the following permanent servants, viz.:—

Two working grieves.
Five ploughmen.
Three lads for cattle and sheep.

Extra male labourers are employed as required about ditches, dungheaps, and composts. Women workers do the green crop and barn work under the grieve's supervision, and also the principal part of the harvest work, which is all done by the sickle, except the oats, which are cut by the scythe.

The men have cottages, each of at least two rooms, on the farms. They are on yearly engagements, and, calculating the provisions they receive at wholesale prices, they receive, including their money wages, but exclusive of rent on their houses, £28 per each ploughman; the grieves, of course, receive considerably more. The boys are fed in the kitchen.

Five pairs of horses are employed—five mares and five geldings. These perform all the tillage of the farm, and also the delivery of the grain and potatoes grown, the larger portion of which—say, at least, two thirds—are delivered at a distance of 11 miles from the steading, being the nearest seaport and railway station. A horse for riding and driving is, of course, kept, as part of the business equipment of the farm. I have been unfortunate in rearing young horses, and I believe chiefly from the cause that the stud-horses travelling in the district are overtasked with mares. It will be observed that a considerable sum (£98 15s., which is after deduction of old horses sold off) is charged for horses purchased; and but one young horse is rearing up on the farm.

I have thus given, in accordance with the requirements of the Society, a full description of the farm, and described the system on which it has been managed and cultivated, and the improvements effected; stated the expenditure and returns; and explained the mode of accounting.

I am further instructed by the Society's Premium List "to consider how much extra or imported manure is required to maintain in high condition a farm of 300 acres cultivated on a four-course shift, when potatoes forming one-half of the green crops and the grass made into hay are both sold off the farm."

Before giving a reply to the question thus put, I would observe that the course of cropping pointed out—namely, a four-course shift—is by no means the best that could be adopted for the development of high or even good farming. It gives but one cleaning in four years to the land—one manuring also. It likewise brings the grass crops into such close proximity to each other that the red clover, the successful growth of which is, if not indispensable, at any rate highly conducive to the fruitfulness of the soil during the rotation, has but small chance of succeeding. Moreover, the two cereals, wheat and oats, will not, manure and cultivate as we may, give their full produce when revolving in such a close and narrow round. The course of cropping pointed out would appear as if intended to meet the case of close proximity to a town or city, where town manure can readily be obtained by purchase, and a high price got for early potatoes and for cutting grass and hay; but I believe that this is precisely the situation in which the cultivation of green crops should preponderate. They are, in such a situation, considerably more money-producing than grain crops; and though these are also necessary, I conceive that in such districts *corn crops should be grown to facilitate the growth of green ones*; as in more distant districts green crops are grown preparatory to grain ones.

The rotation I would consider most appropriate for such a situation is a five-course shift of this nature:—

1. Turnips, swedes and yellows, and mangold.
2. Potatoes.
3. Wheat.
4. Clover-grass.
5. Oats.

Or, viewing the facilities in such a district for the disposal of dairy produce and of early lambs, I would be inclined to make it into a six-course shift by continuing the grass as a pasturing crop for a second year, in which case there would be sown, along with Italian rye-grass and red and alsike clovers for the first year's cutting, a mixture of seeds for second year's pasturing. The only objection is the distance of time between the cleaning crops, which, leaving an interval of three unfallowed years, might tend to make the land foul; but, as the two green crops follow in succession, an opportunity is afforded of thoroughly destroying every root-weed; and if surface or annual weeds are feared, they can be kept down by drilling the corn and hoeing it either by hand or machine. I think that even an improvement would be made on this course by taking barley after the wheat preparatory to laying down with grass. It would then stand a seven-course shift; thus—

1. Turnips and mangold.
2. Potatoes.
3. Wheat.
4. Barley.
5. Clover-grass for cutting.
6. Pasture.
7. Oats.

Following out, however, the instructions before me, I take the case of a farm of 300 acres on a four-course shift; say—

75 acres grass cut for hay.
75 „ oats.
38 „ potatoes.
37 „ turnips, mangolds, cabbage, and carrots.
75 „ wheat.

I would apply to the grass, in March, 2 cwt. Peruvian guano per acre; and in April or early May, when showers are falling, 1 cwt. nitrate of soda. An early and a heavy cut of grass for home consumption by horses and soiling cattle, and for making into hay, would thus be obtained. Thus treated, I would calculate on a good aftermath, to be either sold or used in the yards, followed by a rich sward for sheep, up to Christmas. It would then plough down for oats, with the prospect of a heavy crop, without any further addition of manure.

I would manure the potato and turnip breaks well, so as to have a full produce from them, and the land ready, without further manuring, for the autumn wheat crop, storing the turnips, &c., early in November. I believe that if a moderate portion of oilcake or other feeding-stuffs is used along with the turnip and mangold, &c., produced, in feeding cattle, the oat straw may be consumed, and the wheat straw trodden into manure; that thus sufficient "muck" (the farmer's surest friend after all) will have been produced at home to give 20 loads per acre to all the green-crop break.

I would give the potatoes at planting 2 cwt. superphosphate and 1 cwt. Peruvian guano per acre, and top-dress them with 2 cwt. Peruvian guano at the first hand-hoeing. This practice I have found by experiment to give the largest produce. To the turnips, &c, I would give 2 cwt. superphosphate and 3 cwt. Peruvian guano per acre at sowing, adding to the mangold 5 cwt. of common salt.

Thus treated—of course presuming careful culture in other respects—I have no doubt that even under a four-course shift "the land would be maintained in high condition," though I question, for the reasons already explained, whether the produce would be so high of any crop as it would be under a more extended rotation.

We would, adopting the practice thus suggested, have a total use of purchased manure to the extent of

375 cwt. Peruvian guano, at 12s.	£225	0	0
75 „ nitrate of soda, at 18s...........	67	10	0
750 „ superphosphate, at 7s............	52	10	0
30 „ salt (six acres mangold) at 1s. ..	1	10	0
	£346	10	0

Or a little more than 23s. per acre. This, though it may appear a high, would, under the circumstances suggested, be, I believe, a wise, safe, and profitable rate of expenditure.—*Journal of Agriculture.*

THE LEADING FEATURES OF THE IMPLEMENT DEPARTMENT OF THE WARWICK SHOW, 1859.

Some idea of the importance and extent of this great gathering of the votaries of Ceres may be derived by those who had not the good fortune to take personal part in it—from the simple announcement, that no fewer than 235 exhibitors displayed at 245 stands a variety of machines, implements, and apparatus connected with agriculture, amounting in number to 4,733—the whole being displayed within an enclosure of more than twenty-five acres in extent. The important position which agricultural mechanism has attained, as exemplified at this Show, may also be illustrated by an enumeration of the various "classes" of mechanism exhibited at this the most successful of all the Royal Society's Meetings. Taking them in their order as published officially, we find that there were eight exhibitors of (1) barley avellers or hummellers, four of (2) bean mills, twenty-three of (3) barrows, five of (4) boilers, five of (5) bone mills, twenty of (6) carts, thirty-six of (7) chaff-cutting machines, six of (8) cheese-making apparatus, seven of (9) cheese-presses, fourteen of (10) churns, twenty-two of (11) clod-crushers, thirty-five of (12) corn-dressing machines, five of (13) corn-bins, twenty-two of (14) cultivators, grubbers, or scarifiers, two of (15) digging machines, eight of (16) dairy utensils, seventeen of (17) draining machines and implements, three of (18) dibbling machines, fifty-three of (19) drills, three of (20) dynamometers, fifteen of (21) fencing, two of (22) fire engines, four of (23) flour-dressing machines, three of (24) food for cattle, four of (25) forges, seven of (26) forks, thirty of (27) gates and posts, twenty of (28) grinding mills, eight of (29) grubbers, seven of (30) harness, thirty-six of (31) harrows, ten of (32) haymaking machines, seven of (33) hay racks, thirty of (34) horse hoes, eighteen of (35) horse-power, twenty-four of (36) horse rakes, four of (37) hose-pipe or tubing for irrigation, &c., fourteen of (38) hurdles, nine of (39) lifting-jacks, sixteen of (40) linseed or corn-crushers, four of (41) malt mills, 6 of (42) mangers, four of (43) manures, five of (44) manure-distributors, thirteen of (45) sheep fencing, seventeen of (46) mowing machines, four of (47), oat-bruisers, twenty-one of (48) oil-cake breakers, forty-three of (49) ploughs, eighteen of (50) pumps, seventeen of (51) rakes, eleven of (52) reaping machines, three of (53) rick stands, twenty-seven of (54) rollers, twenty-four of (55) root cutters or pulpers, fourteen of (56) sack trucks, fourteen of (57) saw tables or machines, thirteen of (58) scarifiers, six of (59) screening machines, three of (60) scythes, nine of (61) seed-sowing mamachines, four of (62) spades or shovels, nine of (63) stable fittings, eleven of (64) steam-cultivators, forty-three of (65) steam engines, seven of (66) steam ploughs, three of (67) steam-cooking apparatus, three of (68) straw elevators, thirteen of (69) subsoil ploughs or pulverizers, thirty-nine of (70) thrashing machines, eight of (71) tile and brick-making machines, four of (72) traction steam engines, nineteen of (73) feeding troughs, twenty-three of (74) turnip cutters, four of (75) root or vegetable washers, four of (76) ventilators, eight of (77) waggons, seven of (78) water-carts, tanks, &c., seven of (79) weighing machines, five of (80) wheels and axles, thirteen of (81) whipple-trees, and four of (82) windlasses. What a contrast in this imposing list of eighty-two classes of appliances which science and art have brought forward to aid the practice of agriculture, to that which a Show held some thirty or fifty years ago would have presented ! Then, but a few names would have exhausted the list; and the plough, the spade, the harrow, and the roller, with here and there a rude attempt at a sowing machine, would have comprised the whole, or nearly the whole, range of agricultural mechanism exhibited. And could any one have foreseen the vast strides which agriculture would take in less than half-a-century, and ventured to have made public its fore-shadowed results, he would have been set down as a wild enthusiast—a mere day-dreamer. Yet in truth, the advance which agricultural mechanism has made has been far beyond the wildest dreams, and the most enthusiastic conjectures or fancies; it has actually outstripped imagination, and put to flight the doubts of the wavering, and silenced the sneers of those who looked upon agriculture as a calling "stale, unprofitable, and slow," not worthy to be ranked as a science, or likely to be stirred with the vitality of modern enterprise. The best answer to such objections, and the most convincing proof that agriculture has now attained to all the dignity of a science, and is not behind any in the energy of its action, or the comprehensiveness of its aims, is such a gathering of the appliances which are designed to aid its practice, as that in which we have this year been privileged to take part, at the quaint old town of Warwick. In the wide range of mechanism displayed to his inspection, the visitor could see in the ploughs, the harrows, the rollers, and cognate implements for preparing the soil—in the drills for depositing the seed—in the harvesting machines for gathering in the produce of the land, and in the apparatus for preparing the same for market, or for fattening the stock—most gratifying evidence that efficiency and economy in daily practice would be ensured so far as mechanism was calculated to effect that object, and see also in its wide range some promise of the still greater help it would afford under more improved and modified circumstances. Nor would it be difficult for the visitor to perceive that this improvement and modification would be brought about by that power which in other callings has so wonderfully helped their progress, smoothed their difficulties, and daily registered new triumphs of its application. We allude to the power of *steam.* It is the power which opens up and controls the future; it is that which, rightly applied, will enable the mechanician, and, through him, the farmer, to win new triumphs, to overcome obstacles, and, still farther, to cause the earth to yield an increase of her fruit. The same power which has bridged the ocean with vessels defying wind and tide, and brought distant places near through the medium of the thundering railway car, will, when taken out amid green fields and waving corn, effect wonders as useful in their results as these. It is the power which shall enable man to change sterile spots into fertile fields—tracts now gloomy with the black moss, glad then with the green trophies of the husbandman—wild wastes, over which the wintry winds now send the sand-heaps in clouds, or whistle amid the seaweeds or the marshy plants, to be then covered with laughing meadows or smiling corn-fields. "Such," as we have before remarked, "and no other, do we deem the future of agriculture aided by steam likely to be; and it behoves those interested to consider well how best they can aid its progress. The engineer has done nobly his part; with his mechanical genius, and the patient perseverance, which is ever its concomitant, he has effected much; it remains for the landowner and the farmer to so further aid him, by doing their part, that he may do more. It is only by a conjunction of effort—the farmer in his field, and the engineer at his mechanism—that rapid progress is to be secured. Each performing his respective duties, and performing them carefully and well, we may soon see the good time, so often sung about as coming, come at last, and, with the blessings of Providence on their efforts, witness the prophecies of old receive their consummation, when the sterile places shall be made glad, the desert be made to blossom like the rose, and even the very hill tops fruitful with the harvest, which makes happy the homes of men, lightens the labour of the field, and gladdens the gaieties of the earth."

Apologizing for the length of these introductory remarks, we proceed now to glance at the leading features of the Warwick Show. As our readers are doubtless aware, the various machines and implements forming the range of modern agricultural mechanism are not all subjected to *trial* on the occasions of the shows of the Royal Society. To ensure efficiency, and to prevent confusion from having too many at work for examination, the machines and implements are divided into leading *classes,* one of which is taken every year for trial. The class in rotation for this year comprised those connected with the "culture of the soil," as ploughs, clodcrushers, harrows, and cultivators. The leading prize was one of £50 for the best application of steam power to the cultivation of the soil. For this prize seven competitors were entered—namely (1), Mr. John Fowler, of London; (2) Mr. Smith, of Woolston; (3) Messrs. Coleman, of Chelmsford; (4) Messrs. Chandler and Oliver, represented by Messrs. Robey, of Lincoln; (5) Mr. Romaine, represented by Mr. Nash, engineer, Isle of Dogs, London; (6) Mr. Samuel Beamish, of Rochdale; (7) Mr. Crowley, of Newport Pagnel. Of these four were disqualified for trial; so that the three—Messrs. Fowler (1), Smith (2), and Chandler and Oliver (4)—were alone engaged in the competition. Of these three Mr. Fowler was the successful competitor.

A full report of the trials of the steam cultivators having already appeared in this Journal, we are spared the necessity of giving the details, and are at liberty therefore to proceed to examine the mechanism of the three sets of apparatus entered for the competition. Of two of these—namely, Mr. Fowler's and Mr. Smith's of Woolston—we gave in our report last year of the Show at Chester full and detailed descriptions; we beg to refer the reader to this, contenting ourselves now with a notice of the improvements recently effected in Mr. Fowler's apparatus.

Since the trial at Chester last year Mr. Fowler has succeeded in very much simplifying the mechanism employed in his steam-ploughing apparatus. The driving drum is attached to the centre of an ordinary portable steam-engine, and is placed between two pulleys, round which the wire rope passes; sufficient grip is obtained by giving the hauling rope two three-quarter turns round the driving drum. The engine is worked along the headland by a chain attached to an anchor fixed in the field, and passing round a drum placed horizontally in front of the engine. The lower flange of the drum is toothed, and with this an endless screw gears. The screw is worked by bevel gearing from the upright shaft which gives motion to the driving drum. To assist the apparatus into its working position, the power of the steam-engine is employed, a pitch wheel and chain being used for this purpose; all that the horse has to do being merely to guide the apparatus in its progression. Mr. Fowler has also greatly improved the self-acting anchor, perhaps the most striking and ingenious feature of his system of ploughing by steam. The frame of the anchor is made entirely of wrought-iron, the windi drum being placed horizontally. Another ingenious modification is noticeable in the water cart; this is made like a circular drum, round the periphery of which the wire rope is wound when wanted to be conveyed from place to place.

Most of our readers are aware of the balance plough used by Mr. Fowler. By simple arrangement the frame is easily made capable of carrying scarifiers in place of the ordinary plough, with shares and mould-board. In comparing the mechanism used this year at Warwick with that employed last year at Chester, we cannot but congratulate Mr. Fowler at the point of comparative mechanical perfection to which—by dint of a persevering labour and an outlay of pecuniary resources worthy of all praise—he has brought his steam-ploughing system; a system which (rightly or wrongly we do not here propose to discuss), accepting the old plough and its peculiar mode of operation as the best and as the most economical for cultural purposes, seems to present to the farmer many, if not all, of the points desiderated in practice.

The other steam ploughing apparatus which remains to be described is the invention of Messrs. Chandler and Oliver; manufactured and worked by Messrs. Robey and Co., of Lincoln. The engine is placed in the middle of the field, and the wire rope which drags the plough is wound on drums on the hind axle of the engine. The rope is taken from the drums over a block placed in front of the engine, and radiates to the two extremities of the field, at which anchors are fixed, carrying blocks, round which the rope is passed. The plough traverses the space between the two anchors. Considerable simplicity of arrangement and adaptabilities to the ordinary class of portable engines seems to characterize this apparatus.

Although the result of the trials of steam ploughing apparatus was not so satisfactory this year at Warwick as anticipated by those enthusiastic in its progress, still much has been done by them in giving a further impetus to the movement; and bringing nearer to a successful solution the question of "Steam ploughing, is it practicable and profitable?" As to its practicability there is little doubt. Steam ploughing, *per se*, is a thing accomplished; but as to its being profitable much remains to be said. Certainly, no system as yet introduced is at all likely to be easily attainable by the majority of farmers having occupations of moderate extent. Descant as we may upon the benefits of steam ploughing, it is difficult to persuade the majority of the practical farmers who look on—and look with interest too—during the operation of any of the systems which have occupied the attention of agriculturists, that such are adapted to their purposes, or could be *easily managed* by them in the field. Certainly, the experience of "trial fields," with their too frequently recurring chapters of accidents, and the "pottering" and "tinkering" consequent upon them, is not favourable, or likely to give on-looking farmers a high idea of the every-day utility of steam-ploughing mechanism. What the ordinary farmer wants—he who lives by farming—is an apparatus easily arranged in the field, easily set to work, and the working efficiency of which can be depended upon within the usual range of farm circumstances. That some of our inventors are fast approaching this desirable point in the march of improvement cannot be denied; but neither can it be affirmed—we make bold to think—that it is *yet* reached. Whenever and wherever an ordinary good going plough has been set to work in close contiguity to a steam ploughing apparatus, the comparisons instituted are rarely in favour of the adaptability of the more powerful apparatus to ordinary farm purposes. Much has to be done to bring the steam plough up to the point of adaptability required; but we have little doubt—looking back upon what the last few years have brought forth—that it can be done; and that if our farmers will only readily go along with our engineers, it will be moreover well done. We have not shared the doubts and fears of some on steam ploughing. Those who thought well of it at a period in its history when little practical progress had been made, have little cause to think less of it now, when in what it has done it gives the best evidence of what it can do. Each year will get rid of old difficulties and register new triumphs, until the steam engine will prove itself as ready a helper in the field as it has done in the farm steading.

In future trials of steam-ploughing apparatus it would be well if well-devised experience could be made as to the "haulage power" of the competing apparatus. To ascertain this, is of as much importance as the determination of the kind of work done. It is obviously closely connected with the economics of steam cultivation. We are aware that this has been in some measure done; but what is desiderated is a more systematic series of experiments, tending to place beyond a doubt the relative mechanical merits of the various systems.

We now propose to glance briefly at the novelties in the department of cultural implements ordinarily used. But before doing so, it will be as well perhaps to register the doings and results of the trials of the three classes of ploughs—"light-land ploughs," "general purpose ploughs," and "ploughs for heavy land." And first as to the light-land ploughs.

The length of furrow was laid out at 175 yards; the depth of furrow to be made by each plough to be 6 in., the width 9 in., and the furrow-slice to be laid over at an angle of 45°. Such were the conditions of trial. The land selected was admirably adapted for the purpose. Each plough entered made a few turns to test its general capabilities of work; afterwhich they were set to plough the measured furrow, and tested during work by a dynamometer, to ascertain their draught. The following makers entered their ploughs for trial:—(1) *Law*, of Shettleston, near Glasgow, Scotland, represented by William Waller of Uddingston, near Glasgow; (2) *Mason*; (3) *D. T. Jones*, near Redditch, Worcester; (4) *Hornsby and Sons*, Grantham, Lincolnshire; (5) *Busby*, Newton-le-Willows, Bedale, York; (6) *Reeves*, Bratton, Wilts; (7) *Tasker* and *Sons*, Andover, Hampshire; (8) *Wallis* and *Haslam* Basingstoke, Hampshire; (9) *Bruce*, Stratford-on-Avon, Warwickshire; (10) *Goulding*, Leicester; (11) *Page*, Bedford; (12) *Ball*, Rothwell, Northamptonshire; (13) *Hensman*, Leighton Buzzard, Bedfordshire; (14) *Ransomes* and *Sims*, Ipswich; (15) *Howard*, Bedford; (16) *Maggs*, Bourton, Somerset. The result of the trials was as follows: The points noted being the time in minutes and seconds taken to go over the measured furrow of 175 yards in length; and the power of draught consumed, as shown by the dynamometer.

No. of Exhibitor.	Time.	Power.	No. of Exhibitor.	Time.	Power.
(1)	,,	,,	(9)	3.10	132.95
(2)	3.15	141.75	(10)	3.2	136.75
(3)	,,	,,	(11)	2.40	132.95
(4)	3.20	139.76	(12)	3.2	144.
(5)	3.2	135.	(13)	2.30	142.3
(6)	3.12	120.625	(14)	2 30	135.93
(7)	3.20	136.54	(15)	2.40	138.46
(8)	3.25	129.9	(16)	2.35	134.55

The result of the trials, as above, demonstrated that the trial of strength lay between Ransomes' and Howard's, Hornsby's plough being decidedly the next best, if not in some respects superior to both of them. Ransome's and Howard's ploughs were subjected to a deciding competition, of which the following is a tabulated result; this being necessitated from a dispute which arose between them, as to the sock of Howard's plough being broken, which diminished the draught. The measured furrow for this trial being 60 yards long:—

Ransomes' ..	0 min.	55 seconds	113.95 power.
,,	1 ,,	0 ,,	113.75 ,,
,,	0 ,,	52 ,,	110.25 ,,
Howard's....	0 ,,	55 ,,	112.7 ,,
,,	1 ,,	0 ,,	111.66 ,,

The following exhibitors entered "ploughs for general purposes" for trial:—(1) *Hitherly*, Thrussington, Loughborough, Leicestershire; (2) *Hornsby*, Grantham, Lincolnshire; (3) *Tasker*, Andover, Hampshire; (4) *Goulding*, Leicestershire; (5) *Page*, Bedford; (6) *Ball*, Rothwell, Northamptonshire; (7) *Busby*, Bedale, York; (8) *Eddy*, Kenford, Exeter, Devonshire; (9) *Hensman*, Leighton Buzzard, Bedfordshire; (10) *Ransomes;* (11) *Howard.* The following is the result of the trials:—

No. of Exhibitor.	Time.	Power.	No. of Exhibitor.	Time.	Power.
(1)	1.40	123.09	(7)	1.20	117.1
(2)	1.40	120.2	(8)	1.28	118.95
(3)	1.30	123.59	(9)	1.8	112.63
(4)	1.25	127.05	(10)	1.56	117.85
(5)	1.10	119.15	(11)	1.35	123.35
(6)	1.12	159.			

The following is the result of the trial of the ploughs for heavy land, the conditions being to cut a furrow 12 inches broad by 9 inches deep, the length of furrow 50 yards. The several competitors were ultimately reduced to three—Hornsby, Ransomes, and Howard:—

Name.	Time.	Power.
Hornsby	.50	132.78
Ransomes	.45	138.475
Howard	1.14	132.35

The second trial gives the following results:—

Name.	Time.	Power.
Hornsby	.45	130.1
Ransomes	.55	135.7
Howard	.50	126.08

R. S. B.

THE STEAM PLOUGH.

Many a four-inch-deep farmer of the clays may have been startled by the statement, that the gain by Mr. Langston's steam-ploughing at Sarsden was £1,500 per annum on 800 acres arable! Not a poorly-managed farm, worth little rent, to be thus raised in value by improved cultivation; but a thoroughly well-drained one, which has been well done for years, with good returns for its tillage and manuring, is to yield an increase of profit equivalent to the above handsome amount. If this be not a grossly exaggerated estimate and over-sanguine expectation unlikely to be realized, the inventors of steam-cultivating machinery might very well head their advertisements—"To gain two pounds per acre annually in heavy-land farming, buy a steam-plough"; or "How to make a fortune on clay land in two years at present prices, by means of the steam plough!"

From inquiries made on the spot, we are enabled to give the calculation of this expected profit. No one will dispute the moderation of the stated expenses incurred in working the steam plough, amounting to £12 per week for thirty weeks in the year, including the allowance of £120 a year for maintaining the efficiency of the machine. If anything, this £12 appears to be £2 too much rather than too little. Neither will anybody be disposed to question the justness of an estimate—that 2s. 6d. per acre over half the farm is saved in preparing the ploughed land for the drill, owing to the less number of rollings and harrowings required; or that 28s. per acre upon a fifth of the farm is saved in preparing ground for the fallow crop—the difference being between one autumn smashing-up and two scufflings by steam-power, as compared with three ploughings and three scufflings by the ordinary system with horses. This is, in reality, understating the case; for more ploughings and grubbings are certainly required, as a rule, in working a piece of strong land fallow. And further, we think that the increase of corn, roots, and artificial grasses—to be looked for as a consequence of deepening the soil to a 10-inch staple, double the depth of the ploughing hitherto practised, and as an effect sure to follow from breaking down through the "pan," pulverizing the soil to an extent and perfection not possible with the slow-moving horse plough, and ceasing to pug and poach with the hoofs of horses and oxen—all this cannot be fairly estimated below the figure stated; that is, equivalent to 8 bushels of wheat per acre upon half the farm. From these particulars, then—not likely to be challenged as strained, unfair, or unreasonable in the least degree—how do we make out the enormous gain of 37s. per acre, or the £1,500 a year from 800 acres?

The steam plough, then, with expenses of the first start, cost £750; and one year's working, and wear and tear, come to £360—making a total outlay of £1,110. Mr. Langston employed on his large holding 24 horses and 12 oxen. There are now no oxen, and only 18 horses; but 4 of these are kept for doing work on the estate, the farm having the benefit of them during harvest. Still as 14 horses are believed by Mr. Savidge, the manager, to be amply sufficient for all the labour required—seeing that the steam machinery, being self-locomotive, never calls for their assistance in removal from field to field, and the stacking of a considerable proportion of corn in the fields makes the journeys of the harvest-cart shorter—we take 14 horses as the requisite future team. The 12 oxen have been sold, fatted, for £240; add 10 horses for £300, this makes £540 realized. Then there is the year's expense of these animals saved—the horses say at £30, and the oxen at £12 each, and the wages of the six men and six boys who worked them; making in all £1,110, just the same sum as that expended in the purchase and year's working of the steam plough. The machine may thus be said to have earned itself in the very first year; and is not, therefore, a heavy addition of fresh capital, but a substitution of the capital in the form of mechanical apparatus for an equal amount of existing capital in draught animals, provender, &c., and labourers' wages, already invested in this extensive business. So that on large farms the purchase of a steam plough is easily within the tenant's ability, without requiring additional means on his part, or in any way crippling his funds for the year. This is a point worth thinking about; but we must now pass on to our calculation. Making a rough valuation at the year's end, we find that the steam machinery is worth some £200 more than the draught animals would have been (that is, reckoning the horses to be worth £5 a-head less, and the oxen £2 a-head more.) Add to this the gain which accrued from tillage operations avoided and saved—that is, 2s. 6d. an acre on half the farm, or £50, and 28s. an acre on a fifth of the farm, or £224. This £274, added to the above £200, makes altogether a direct pecuniary profit of £474 in the course of the very first year of steam ploughing, or surplus remaining after the whole of the machinery has been paid for.

Extraordinary as this may be, the second and subsequent years will show a larger gain still. There is neither the steam plough to be bought, nor any money to be realized by sale of displaced horses and oxen; but the estimate must be made in this way: At the end of the year the machinery is worth £200 more than the teams would have been; the saving in tillage operations has been £274, as before; and the difference between the working expenditure of the steam plough and the horses, &c., is £200 (as any one may compute, at the prices for horses, &c., given above) in favour of the steam. Thus we get no less than £674 as the direct profit per annum which will arise during the second and every following year, the entire machinery being supposed to be maintained in repair and efficiency at the cost already stated. This is a long way short of the £1,500. But we have not done yet with the advantages of this wonderful machine. The £674 arises only from the yearly economy of performance; we have still to take into account the superior value of the deeper and more pulverulent tillage. We said before that the supposed increase of 8 bushels of wheat per acre upon half the farm is not at all a high equivalent for all the increased yields, improved weight and quality, even crops, &c., of all varieties of grain, roots, and clovers, and for the increased production of beef, mutton, and pork, from the larger supplies of food thus grown. And the large augmentation of produce infallibly arising from the transformation of a shallow clay staple into a deep mould by means of tillage processes is now too well known and demonstrated in numberless examples to need any argument or proof from us on the present occasion. Taking the 8 bushels of wheat at 40s. upon 400 acres, we have £800 worth of cropping as the additional yield of the 800 acres arable in consequence of steam culture. Adding this, then, to the £674 previously calculated, there comes out the sum of £1,474 as the improvement in the future income from Mr. Langston's farm.

The moral of the story is evident enough. The steam plough is a ready means for helping the farmer in this time of low corn markets, and a sure instrument for permanently raising the value of land. Let landlords see to it.

We have had an opportunity of consulting the books of Mr. James Arnot, of Woodcote, near Carshalton, Surrey, containing minute particulars of his working expenses with Mr. Fowler's plough. As the land is principally light, ploughed ordinarily 5 or 6 in. deep, with a pair of horses, and therefore resembling a vast proportion of the soil in the kingdom, on which steam-ploughing may be expected to show its capabilities, some very valuable data are here afforded for the information of inquiring managers.

From the week ending October 15th to the week ending December 10th, 1859, there were 39 days' labour, &c., paid for; the engineer at 3s. a-day, two men at 2s. 6d. a-day each; two boys at 1s. 2d. a-day each; and the water-carting, with one horse and a boy, at 4s. a-day. The removals from field to field were accomplished by four horses, and in some cases with six horses, for a few hours at each time, the machine not having been fitted with the self-propelling gear. The repairs we allow for are only those of wearing parts, together with the sharpening of coulters, not including accidental and other breakage, which will be reckoned under the general head of wear-and tear, or maintaining the efficiency of the apparatus. The land being much of it close upon the chalk rock, a great many new plough-shares were required. Oil and grease are charged at the price paid for them; and the coals consumed cost 17s. 3d. to 17s. 6d. and 18s. per ton. The totals of the payments made during the six weeks are—for labour and water-carting, £26 15s. 9d.; repairs, £2 8s. 6d.; six shiftings, £1 10s.; oil and grease, £3 1s. 6d.; coals. 20 tons, £17 6s. 7½d.—The whole amounting to £50 18s. 4½d. The number of acres ploughed was 175, of which 55 acres were at 10 to 12 in. in depth, and the remainder at 4 to 6 in. in depth. The general average cost was 5s. 10d. per acre. We shall not go into the question about which such varying opinions exist; that is, the cost of wear-and-tear, to be added to the working expenses; because Mr. Fowler himself is willing to keep the engine-rope and entire machinery in good working order, by contract; and he offers to maintain the efficiency of the machine for seven years, at an annual charge of £120, more or less, according to the power and prime cost. This sets all dispute at rest; so that we have only to divide the amount over the acreage ploughed yearly, in order to find the total outlay per acre. Now, the average daily rate of work was about 5 acres a-day; and supposing there to be 30 weeks or 180 days' work in a year, on Mr. Arnott's and neighbouring farms, this will be about 900 acres of ploughing, at 2s. 8d. per acre for wear-and-tear, or 8s. 6d. per acre for the total expense. If the number of acres ploughed in a year is confined to only 450 acres, the wear-and-tear would be 5s. 4d., and the total cost of ploughing 11s. 2d. per acre. We suppose that by horse-power the common ploughing might be valued at 8s., and the deep at 16s. per acre, making an average price for the 175 acres, of 10s. 6d. per acre. So that the steam-ploughing, at 8s. 6d. (or according to the other supposition, 11s. 2d. an acre) does not show any particular saving in outlay, as compared with ploughing by horse-power; though, it must be remembered, this was during short winter days. Summer would show a more favourable result. That the advantages to the farmer are very great notwithstanding, and in a variety of ways, no one will be more ready to acknowledge and demonstrate than we are; and, indeed, we have certainly done our part on many occasions in urging those vast benefits upon the business farmer, who seeks larger and securer crops, a more economical system of cleaning his land, and a deeper and more thorough tillage. So, let no one think we are exposing the short-comings of steam-cultivation, when we show that on some light lands the gain is not so much in saving of outlay per acre in any single operation, but arises rather from other considerations which we have not time to dwell upon just now.

We may get a good deal that is worth knowing out of these figures of Mr. Arnot's steam ploughing. Let us look at the variable nature of the work and differing cost per acre, in different fields. No. 1, 26 acres, was ploughed at the rate of about 5½ acres a-day. The coals, 11¾ cwt., came to 9s. 4d.; the labour and water-carting at 13s. 8d.; the average of six shiftings, at 9d.; the repairs at, say, 1s. 3d.; the oil and grease at 1s. 6d.—make altogether 17s. 4d. per day. This, added to the cost of fuel burnt, amounts to a total of 26s. 8d. a-day, which is 5s. 2d. per acre for working expenses. No. 2, 14 acres, was ploughed at the rate of 7 acres a-day, with 14 cwt. of coals. These, at 12s. 3d., added to the labour, &c., 17s. 4d., came to 29s. 7d. per day; or about 4s. 3d. per acre. No. 3, 4¼ acres, was ploughed at the rate of about 5 acres a-day, with 12½ cwt. of coal. These, at 10s. 11d., added to the labour, &c., 17s. 4d., amount to 28s. 3d. a-day, or 5s. 8d. per acre. No. 4; 23 acres, was ploughed at the rate of about 4¼ acres a-day, with 14¼ cwt. of coal. The coal and labour come to 29s. 9d. a-day, or 7s. per acre. No. 5, 9 acres, was ploughed at the rate of 4½ acres a-day, with 10 cwt. of coal. Coal and labour come to 26s. 1d., or about 5s. 9d. per acre. No. 6, 12 acres, was ploughed at the rate of about 4¾ acres per day, with 12 cwt. of coal. Labour and coal amount to 27s. 10d., or about 5s. 10d. per acre. No. 7, 22 acres, was ploughed at the rate of more than 4¾ acres per day, with 14¾ cwt. of coal. Labour and coal amounting to about 30s. 2d. a-day, or about 6s. 4d. per acre. No. 8, 10 acres, was ploughed at the rate of 5 acres a-day, with 11 cwt. of coals; coal and labour, &c., amounting to 26s. 11d., or about 5s. 4d. per acre. No. 9, 7 acres, was ploughed at the rate of 5¼ acres per day, with 6¾ cwt. of coal. Coal and labour, &c., came to 23s. 2d., or about 3s. 9d. per acre.

From these particulars we may frame a table as follows, the fields being arranged in order from the heaviest to the lightest work, as indicated by the quantity of coal burnt per acre.

Field.	Depth of work.	Coal burnt per acre.	Expenses per acre.
No. 4.	10 to 11 inches.	3⅓ cwt.	7s. 0d.
No. 7.	12 inches.	3 cwt.	6s. 4d.
No. 6.	4 inches.	2½ cwt.	5s. 10d.
No. 3.	4 to 5 inches.	2½ nearly.	5s. 8d.
No. 5.	4 inches.	2¼ nearly.	5s. 9d.
No. 8.	10 inches.	2¼ nearly.	5s. 4d.
No. 1.	5 to 6 inches.	2¼ nearly.	5s. 2d.
No. 2.	4 to 5 inches.	2 cwt.	4s. 3d.
No. 9.	6 inches.	1⅓ cwt.	3s. 9d.

It appears, from this statement, that the comparative cost of ploughing land ought not to be estimated from the depth only; for No. 4, at 10 to 11 inches, is a good deal harder work than No. 7, at 12 inches; No. 6, at only 4 inches depth, and No. 3, at 4 to 5 inches depth, were twice as hard work as No. 9, at 6 inches. And No. 8 and No. 5 were about alike in respect of fuel consumed per acre; yet the former was at *more than double the depth* of the latter. Hence, the judges at agricultural meetings, as well as farmers in general, are liable to form very erroneous comparisons between steam-ploughing and horse-ploughing, as respects economy, if they merely reckon according to the depth of the work. Horses are pushed through their acre a day just the same, no matter whether the 4 or 5 inch be as difficult as 10 inch ploughing or not; while such deep work as 9 or 10 inches is allowed extra time and price for, when perhaps it may have been no harder to plough than the other. But the dynamometer will now enable us, in future trials, to ascertain the value of any horse-work performed, without taking depth or other conditions into account.

It appears that beside the variable amount of resistance of the soil in different fields to the passage of the plough, arising either from stiffness of the ground, rocky nature of the subsoil, or the great depth of the work—a resistance felt and indicated at once by the steam-engine, though horses manifest their fatigue in a less sensitive degree—there is also a difference in the amount of coal burnt, occasioned by delays in working, in case of very angularly-shaped fields, an also during foggy weather.

The largest amount of work done in a day was in ploughing No. 2—potato land for wheat, the ground clear and dry, the days 9 hours long, and no time lost—14 acres in two days, or 7 acres per day, at a total cost of 4s. 3d. per acre. Of course, with longer summer days, 8 or 9 acres would have been turned over, at a cost of say 3s. 6d. per acre, including everything. No. 1 was rather wet and heavy, and loss of time was occasioned by misty mornings. No. 3 was so angular in form that the ploughing could not be worked at highest speed. No. 4, oat land for potatoes, was very hard-bottomed, the plough coming often against the chalk rock, and breaking many shares; but the work was very good, being left as if dug by spade. In ploughing No. 5, invery foggy weather, the engineer, not being able to distinguish the signals, ran the plough against the anchor, and broke the sheave. In No. 6, the shares frequently came against the chalk rock at 4 inches depth; with the work slow, owing to the angularity of the fences. On November 12th, there occurs the memorandum of "Examining brasses, &c., half a day"; and on November 19th, "Examined tackle and engine, a quarter of a day."

We must again reiterate our caution, that while the economy of performance may vary so much that on clay land you may save more than one-half, and on some light land find little comparative saving over horse-ploughing, there are plenty of other good reasons why the steam-plough will pay handsomely, and relieve the farmer of many difficulties.

STEAM CULTIVATION.

BY MR. J. J. WILLIAMS, OF BAYDON, WILTS.

The usual monthly meeting of the Hungerford Farmers' Club was held at the Bear Hotel, on Wednesday, February 1st, when Mr. J. Williams, of Baydon, Wilts, delivered an address on "Steam Cultivation: The Past, Present, and Future." The chair was occupied by Mr. H. Cundell.

Mr. WILLIAMS said—In complying with the wishes of your committee, to introduce the subject of Steam Cultivation for discussion this evening, I thought it would be as well to divide the subject into three parts — the past, the present, and the future: the two first of these, in order to develope what has been done by the several systems of hauling and modes of culture, with its effects, as far as has been ascertained: the latter, to illustrate and point out from past experience the most practical and economical method for future observation and guidance. It appears that, for many years past, a few individuals have been impressed with the idea of the practicability of cultivating the land by steam power, and from time to time have made attempts to accomplish this great object, but they have all more or less failed till within the last seven years, when a new material, "the wire rope," has been produced, which has thrown a new light on the subject, and caused the present inventors to be successful, where their predecessors failed for want of this useful article. As a proof of this, an invention of Mr. Heathcoat, the late, and, if I mistake not, the present, M.P. for Tiverton, so long as 28 years ago, might have succeeded, had he been enabled to use the wire rope instead of chain, which, to be of sufficient strength, was too weighty for any practical purpose. As nothing of any importance can be obtained from these early trials, I will merely observe of Mr. Heathcoat's plan that, had he possessed the wire rope, and had at that time good cultivating implements, my belief is, that at this period steam cultivation would now be the rule, instead of the exception. Among the other parties who have tried steam-ploughing before the rope made its appearance, was Mr. Hanham, whose machine was made by Barrett and Exall, of Reading, and which was precisely similar to Mr. Smith's mode; but he, too, gave it up as a losing affair. I will therefore, commence my observations on the rope system by noticing the first of my plans for hauling, which, after three years' experimenting on, I took out a patent for in May, 1855. The experience I had gained having brought me to the conclusion that the *modus operandi* should be on the same principle as by horses—viz., by making the engine and anchor move on each headland, to keep opposite the work, and so be enabled to plough the longest furrow with the shortest amount of rope. I felt by experience that this was the only right principle to work on; and I subsequently took out a second patent, for working two engines and machine, one on each headland, forming their own anchors, and still keeping opposite the work by moving forward as each turn was completed. I would here observe that there is no method by which so small an amount of rope in action is required, as by this one. I mention my own plans first, not from any feeling of egotism, but simply because I was the first in the field, of all those who are now before the public, and likewise because I wish to class the rope system under two heads—viz., the moving engines along the headlands, to keep opposite the work; and the stationary engines whilst at work, similar to the thrashing of a corn-stack. Mr. Fowler, although he commenced on the fixed-engine principle, subsequently adopted my method, with the vast improvement of using grooved drums with an endless rope, and an anchor made self-acting. Many of you have seen the simple and beautiful method by which his anchor is made to propel itself forward; and the same with the engine, moving herself at the same time she is drawing the ploughs, so that no loss of time occurs when at land's-end. The rope is an endless one, and, running in grooves, never comes in contact with any part of itself, as is the case when coiling on drums. The rope, by this means, is very much saved from wear-and-tear; and the slack is given out or taken up from capstans on the cultivating implement. You are many of you aware that with my second invention I have made the engines locomotive, by means of a pitched chain working from the crank shaft to the hind-wheel, which Mr. Fowler is now applying to all the engines which he sends out. My two hauling patents I have assigned to Mr. Fowler, for him to work out; and these different systems, together with another of Mr. Eddington's, using two engines mounted on platforms, and removeable when required for thrashing or other purposes (which is nothing more or less than my principle in another form), are the only ones I know of, working on the important principle which I have before mentioned, of ploughing the longest furrow with the shortest amount of rope. Mr. Fowler has likewise adopted Mr. Eddington's plan when applying his principle of the endless rope to the portable engines already in existence. You will, therefore, observe that he is in possession of all the plans offered to the public on this system, and which has been appropriately termed "Fowler's long range." The other modes that have been adopted, by rope traction, I will class under one head. They vary in detail; but they are all alike in principle, and have been aptly termed, by the facetious individual who named Fowler's "the long range," as "the roundabout system." I shall only mention those that have appeared at the shows of the Royal Agricultural Society. The first of these, Messrs. Fiskins', was shown at Carlisle, 1855, which differed from everything that has been brought out since, and as it has never been seen in public from that time, I conclude they failed in bringing it to bear. The next year at Chelmsford, Mr. Fowler and Mr. Smith were competitors for the prize on the rope principle. I entered mine, but the terms on which the prize was offered were so indefinite, that I determined to remain at home, and thereby saved myself a large amount of cost. Mr. Fowler's and Mr. Smith's plans were both on the principle of the stationary engines, or "the roundabout system," and they differed in this respect, that Mr. Smith placed his ropes all round the field, forming a square, and using his double tom for ridging, together with his well known grubber; while Mr. Fowler, by using horizontal drums was enabled to place his ropes in a triangle, thus saving a considerable amount of rope, and having only one pulley for each, to guide the plough from one headland to the other, that pulley being fastened to his well known anchor, which was then drawn forward by the engine, when the plough arrived at each headland, and was attended to by the men who went with the plough. Some idea may be formed of which was there considered the best system, as the judges decided to give Mr. Fowler another trial at Mr. Fisher Hobbs', and on that taking place they decided against him on the score of economy, as against horse power, by 2½d. per acre, he having ploughed his land at 7s. 2½d., whereas they put that done by horse at 7s., I suppose including wear and tear, very cheap ploughing for Essex land. Such was the result at Chelmsford. We will now travel to Salisbury, where Mr. Fowler and myself were the competitors on the rope system. Mr. Fowler here adopted the long range, having found by experience the cost of the additional rope required, the wear and tear of the same, and what was of still greater importance, the loss of power sustained by putting the work at such a distance from the engine, that he gave up the roundabout system altogether, and appeared at Salisbury, as I said before, with the long range, with the great improvement to his anchor, that it was self acting; but with his drums rigidly fixed to the engine. The result of the Salisbury meeting is too well known. It was never intended that the £500 offered for the prize should be won at that meeting; and the less that is said about it the better. From that day the rope system assumed a new feature. Mr. Fowler amalgamated my plans with his own, went to Stirling, and won the £200 offered by the Highland Society, and, moreover, has won every prize since for which he has competed, amounting in the whole to the sum of £925, together with the gold medal at Paris, and a high commendation for his second set of tackle at Warwick. At the Chester meeting, Mr. Fowler and the Messrs. Howard were the competitors on the rope system, the former ploughing the ground, and the latter using Smith's cultivators, manufactured by themselves; but as their work was not complete till it was done a second time, Mr. Fowler was awarded the prize of £500, and the judges in consideration of the excellent manner in which the work was finished by Messrs. Howard, recommended the gold medal of the Society to be given to them. Warwick was the next and last meeting of the Royal Agricultural Society's trials of Steam Cultivators. Mr. Fowler was there with two engines, one using a plough, the other a cultivator. Mr. Smith competed as usual with his grubber, and Messrs. Chandler and Oliver were also competitors for the £50 prize, who introduced a new arrangement of carrying the winding drums on the hind axle of the engine, one on each side, then conveying the ropes round pulleys fixed in a framework, and working something like Mr. Fowler's at Chelmsford, except that they had four pulleys to run instead of two, and their anchors had to be shifted by manual labour like Mr. Smith's; the result of these trials was, that Mr. Fowler was awarded the £50 prize for his plough, and his cultivator was highly commended; in fact, it is not too much to say, and I think every farmer who saw the work done by his cultivator will agree, that such perfect work in tillage was never before accomplished by any implement whatever. But we must retrace our steps in some degree, in order to illustrate what has been attempted, rather than accomplished by the traction engines competing for the prizes of the Royal Agricultural Society. The Carlisle meeting was the first at which the attempt was made. Mr. Usher, of Edinburgh, brought an engine of high pressure to travel over the soil with a set of rotary ploughs in the rear; but on the trial it was found that she could scarcely move herself on account of the rain that had fallen, and we have heard nothing of his plough since. Mr. Boydell had his steam horse there, but for want of some implement to cultivate the soil, he could only show her powers, by hauling another engine from the field into the show-yard. At Chelmsford, Mr. Boydell was again competing, but was again without a practical implement. At Salisbury he appeared in conjunction with Mr. Burrell, of Thetford, who brought four 2-furrow ploughs; many there present will remember the admirable manner in which she climbed the hill, an incline of 1 in 7, and took with her a supply of coal and water, for the day, together with the ploughs for use. But despite this advantage, she could not manage to accomplish half the allotted work. Mr. Collinson Hall, too, with a very high pressure engine, and comparatively light to travel, did but a very small portion of his, whilst both the fields were finished where the ropes were used. At Chester, again, the fields where ropes were used were completed, whilst Messrs. Boydell and Burrell were from some cause hindered from getting to their work, and Mr. Ricketts, of Buckingham, who exhibited a traction engine with the long-wished-for rotary grubber in its rear, was obliged to leave the engine in the field, with its work only half-finished, from the breaking of a chain. Warwick again, witnessed the same results; the rotary cultivator of Romain broke down, so that in no one single instance have the traction engines completed the work allotted them at the shows of the Royal Agricultural Society. There is another instance which I might mention, which occurred at Lord Hatherton's in Staffordshire, at a trial of different modes of steam culture, where an engine of the Marquis of Stafford's working a rotary grubber, could not travel at all on account of the rain, whilst Mr. Fowler's, and Lord Hatherton's (who used Smith's tackle) were making good work by the rope system, a sufficient proof that the learned author of "Talpa, or the Chronicles of a Clay Farm," in criticising our present mode of "pulling a plough," although he did not admit to notice the law of gravitation with respect to the sole of a plough, did so, on the more momentous question of the weight of a steam-engine when filled with water, and carrying in addition a supply for use, together with fuel, and the weight of the rotary cultivator, which is to be six feet in width. I have no hesitation in saying, from having witnessed the greater part of these trials, that except on comparatively level ground, it can never be accomplished, and moreover, even there it cannot be done, except assisted by the endless railway. It is but fair on the part of Mr. Boydell, to observe that his engines have proved themselves capable of drawing great and heavy loads, and he has always been in the rear at the trials of the R. A. S. for the want of a suitable implement to work with. With respect to the implements used and the effect produced by the avoidance of compression with the horses' feet, a few observations will suffice, as I consider it needless to note any but those in use by the rope system. Mr. Fowler abides by his original plough, which he alters into a grubber when required, by removing the bodies, and substituting a flat fin, which leaves the soil in a beautiful condition. Mr. Smith still sticks to his cultivator or smasher, and his double tom for ridging. I use my own cultivator, which I consider the best for all purposes, on account of its independent action from the framework, and I think Mr. Chandler will agree with me, that the work I did with my cultivator for his brother-in-law, at Hilcot, could not have been done by any other implement in existence. My ploughs, though one would differ from Mr. Fowler's, inasmuch as every plough is separate and distinct from each other, and they make capital work. Mr. Coleman has brought out a strong and powerful grubber on the principle of his scarifier, but it is much too heavy for the width it takes. Messrs. Chandler and Oliver, have invented a plough, which was exhibited at Warwick; it consists of three rigidly fixed ploughs in a frame, working on the lever principle within another frame, but to enable them to work well they have placed them so close together, that unless the soil be perfectly dry and free from filth, I am certain they cannot work without choking, and which I saw from the report of the Long Sutton trial which lately took place, was the result. With regard to the economy of the work hitherto accomplished, of course to a great extent it has been experimental, and consequently so far has been costly; but enough has been done in trials, and during the last twelve months by the tackle now sent out to many first-class practical farmers, to show that in addition to the superior manner in which all the work is completed, and the labour subsequently required to induce the soil to a good tilth being lessened by a full third, the ploughing and cultivating is still done at less cost than by horses. At the trial of Mr. Fowler's "round-about system" at Mr. Fisher Hobbs', the judges of the R.A.S. put his work at 7s. 2½d. per acre, and calculated that horses would have done it for 7s. Now, allowing that horses could have done it at that price, even here was a very close run; and at Chester the victory of steam over horses was so complete that I will give you a few extracts from the judges' report, at the same time observing that I have, for the sake of brevity, omitted every part I possibly could to render it intelligible. "The daily working of Fowler's machine we estimated at 2s. 6d.; these results enable us to give the cost of ploughing by Fowler's machine, of light land at 6s. per acre.

According to the rate of work done in trials, or taking six acres per day as the average, at	7s. 2d.
Of heavy land, at..........................	9s. 2d.
Of trenching ditto, at......................	18s. 4d.

our estimate of the quality and value of the work thus performed is, that the light land could not have been done by horse power for less than 8s. per acre; that the heavy land could not have been ploughed by horse power for less than 12s. 6d. per acre; and that the trenching by manual labour, with the spade and grafting tool, could not have been done for less than 10d. per pole, or £6 13s. 4d. per acre, and then only in a very inferior manner. Smith's system of cultivation, as exhibited by Messrs. Howard, requires two operations. The principal trials took place on the heavy land at Blacon, when four acres three roods were gone over by the first operation with the smaller cultivator (three tined), taking a breadth of twenty-six inches, in ten hours thirty-seven minutes. In the second operation, with the five tined cultivator, taking a breadth of forty-eight inches, four acres three roods thirty-three poles were finished in four hours fifty minutes, which, inclusive of stoppages, &c., gave a result of work completed by the two operations of about five acres in fifteen hours, or three and a-half acres per day. The daily working expenses of this machine are £2 6s. 9d. This shows that the work was done at a cost of fourteen shillings per acre, while to effect a similar result with the ordinary implements and horse power, three distinct operations would be required, which could not be performed at less than eighteen shillings and sixpence per acre. We wish it to be distinctly understood that throughout the trials we have charged the machines with the maximum of working expences, and have credited them with the maximum value for the work performed. From the foregoing result of the trials, intrusted to our decision by the council of the R.A.S., and conducted throughout under our immediate supervision, it is beyond question that Mr. Fowler's machine is able to turn over the soil in an efficient manner at a saving, as compared with horse labour, on light land, 2½ to [illegible] per cent.; on heavy land, 25 to 30 per cent.; and in trenching, 80 to 85 per cent.; while the soil in all cases is left in a far more desirable condition and better adapted for all the purposes of husbandry. We are, therefore, unanimously of opinion that he is fully entitled to the prize of £500, and we now give our award accordingly." Signed by the four judges. The judges in their report at Stirling, where Mr. Fowler was awarded the £200 prize, speak of the economy of the steam-plough over horses as equal to £1 per day; whilst several gentlemen who have tried Mr. Fowler's plan, all speak to the economy as well as the efficiency of the work they have done. A letter from Mr. Redman, the only person I know of that has had any material trouble with his tackle, I will read to you, that you may form your own opinion, how satisfied even he is with steam culture:—"Overton, 26th Dec., 1859.—Mr. Williams—Dear Sir,—In reply to your enquiries respecting my steam ploughing this season, I beg to state that in consequence of the old set or windlass part giving way (which was of the original construction), we were left without a set for some time; Mr. Fowler then sent an eight-horse set which ploughed about 40 acres; Mr. G. Pocock, of Bourton, also kindly lent me his 10-horse set, and ploughed nearly the like quantity; this completed my ploughing for wheat, with the exception of a few acres of after turnips, which went in healthy and well. The eight-horse set went to another farm, and Mr. Pocock had his away; also, consequently, I have a good part of my fallow land to plough, which I mean to reserve till I get my new set of 12-horse tackle next month. I am fully persuaded that should steam cultivation (and I am in favour of the turn-over system) will be the rule, and not the exception, on large heavy-land farms. The soil is left in a very different state by this new application than when trodden and poached by animals, as it must be on some lands this season. I am as satisfied as ever I have been with steam culture, and would not be without it on any account; if any part of this statement of facts is useful to you I shall be very pleased. With kind regards, I am, yours very truly, T. H. Redman." If I turn to Mr. Smith's supporters, I there find lots of practical men all giving testimony to the excellence of the work, and speaking of even the round-about system as an economical one. These several reports speak for themselves, and require no comment from me except to observe that it is conclusive, at the least, that steam cultivation on the rope principle is an established fact (Hear). Such is the history of the past. As regards the present, we have, in our own immediate neighbourhood, four sets of Mr. Fowler's tackle and one of Mr. Smith's; whilst the number of farmers in Great Britain using steam cultivators cannot be far short of 100, and allowing each to cultivate 400 acres, it will amount to 40,000 acres per annum already cultivated by steam. Still this is slow work, as we ought to number our customers by thousands instead of hundreds, and my belief is we should soon do this if it were not for the hesitation of some of our best men, who have made up their minds to go into it, but are waiting to see what may still come uppermost. This is not very surprising when we consider how proverbially cautious the farmers as a class are, and again, when the learned author of Talpa, whose work got into the fourth edition in 1857, together with many leading men who, no doubt, base their faith on the principles laid down in that book, are coming out at some of our public meetings, "That they have no doubt but it will some day be accomplished," but recommending "to wait a little longer." This puts me in mind of a pack of young hounds cub hunting, whilst Messrs. Fowler and Smith are going right ahead, business like, sticking like bees to their game, working every inch of ground. "Tally ho," cries the author of Talpa, "you are all wrong; the fox is gone this way." Back comes part of the pack leaving the few leading ones to pursue the right scent; the pack are no sooner got back to the view hallo than out cries a third, "Tally ho." Here we have one that will plough forty acres per day, a Jonathan that will beat everything in the old country (Laughter). Strange, but true, that these false reports should weigh with some of our first-class men; that they having eyes, cannot see for themselves, that which I have taken some pains to show in this lecture, that the law of gravitation is decidedly against the whole principle of locomotive traction over the soil, to say nothing, that if the superiority of steam culture on heavy soils consists to a great extent in the avoidance of treading by the horses' feet, what will the steam engine do when travelling to and again over the soil? But we shall not complete our observations of the present time if we omit to notice this grant from America. The only idea I can form of it is from an engraving in *Bell's Weekly Messenger*, about two months since, and it requires but a little knowledge of ploughing at first sight to condemn the whole affair. The engine looks practical enough if vertical boilers will answer the purpose, which is doubtful; but the ploughs being placed two abreast in the rear to the amount of ten or twelve, settles the point as far as regards English agriculture. Why, to place four ploughs in a frame they ought to, and must, to make work, have a space at least of eighteen inches between each (I give mine two feet), so I leave you to judge how a ten furrow plough would leave its furrows at lands end, with a space of from fifteen to twenty feet between the first and the last plough; but brother Jonathan does not work in this way, and he has placed his plough in two rows side by side; the consequence is, the first row of ploughs make several rafters and the second turns them over. Not a first-rate method of making a seed bed, but yet suitable to the circumstances of the American farmer to break up the large tract of prairies which they possess and which is wholly different from our own system, inasmuch as the engine is always travelling on grass land which in a measure allows it to progress. But, admitting that it is a practical implement for American purposes, if brought to England I am certain, from the causes I have mentioned, it would share the same fate that our own locomotives have done. And, moreover, we know enough of the reports that come across the Atlantic to be certain that these wonderful effects will bear the rule of reduction to an enormous extent. It would be occupying too much of your time to quote the various opinions of the many practical farmers that are using steam-power at the present time; suffice it to say, they one and all approve of the several plans they have adopted, and it is satisfactory to know that where one or two sets of tackle are planted in a neighbourhood, it is not long before some of the neighbours are so satisfied of the practical working of the same, that they order some for themselves, though slowly, yet surely, progressing. Let me now ask, why should there be any further hesitation on the subject? If you look to Mr. Smith's tackle you will find very little alteration in the mode since he began: the machinery is well made by Messrs. Howard, of Bedford, and Mr. Smith's grubber makes good work. If you look to Mr. Fowler, he has so simplified his plan, that there is nothing that can be dispensed with, the whole apparatus attached to the engine weighing considerably less than a ton, and every engine made to take herself and tackle from field to field, and from one locality to another. Those who might prefer the windlass of Chandler and Oliver attached to the hind axle of the engine, and working on the round-about system, may rest assured that, with good cultivating implements, they may work with the same advantage as Mr. Smith does. What, then, can there be to wait for? The author of Talpa (if there really is anything in his beautiful theory beyond the mechanical part of the rotary motion of the drum to pull a plough) should join with some first-rate engineer, while his imaginative mind can lead the way and teach how this great principle is to be carried out, or succeeding generations will lose the advantage which his knowledge of the subject could at the present time be brought to bear in its construction. Then, in that case, it might be wise to wait a little longer, and see the result. Again, if in these "go-a-head times"—these days of "practice combined with science," it should be anticipated that the engines will be made to generate their steam without fuel, then I would say, "wait a little longer." But, on the other hand, if, as practical men, the farmers of England are free from such fancies as these, and are disposed to go into steam-culture, they may rest assured that the present mode of hauling (which is the most important thing to look to) is brought to such a state of simplicity and perfection, that, wait as long as you will, you can scarcely improve it (Hear). Moreover, the longer the farmers of Great Britain wait, the longer will they deprive themselves of the benefit which will accrue to them and the public at large from its good effects. Some of these it may be as well to mention here, viz., autumn cultivation—the admirable manner in which the soil is prepared for root crops, and the advantage those who have steam power will have over their brother farmers whenever we have a wet summer. I shall be very much deceived if, with one wet summer, orders by the hundred do not come in for steam ploughs. But it might be said, the outlay is the cause of the delay; it costs so much to begin with. Let us see how this will bear the test of argument. I will take two farms of 400 and 800 acres; the 400 acre farm requires sixteen horses to cultivate it well; eight of these might be sold, say at 30*l*. each, which would make 240*l*., and this, if the owner had an engine, would nearly cover the expense of a set of tackle. Again, the 800 acre farm would require at least thirty horses, twelve would do the extra work, and eighteen might be sold off; reckoning these at 30*l*. each would produce 540*l*. This would require of the owner only 160*l*. in addition to pay for a ten horse set of Fowler's tackle complete, and recollect he would have the engine for other purposes as well. But, let me observe, the outlay is nothing when compared with the annual saving that might be effected on a farm of 800 acres. The eighteen horses, which I am certain could be dispensed with, cannot be kept well for less than 30*l*. each, per annum, which will amount to 540*l*.; add to this the cost of six men and boys, at 12s. per week, to work them for the year, 187*l*. 4s., will make a total annual cost of 727*l*. 4s. Now, what will be the annual cost of the ten horse engine? I will take the figures of the judges at Chester (who, you will remember, charged the maximum price of Fowler's machine, 2*l*. 6s. per day), from which I will deduct interest and wear and tear (which I have not charged on the horses), 2s. for removal, being half, as the engines now move themselves, which was not the case at Chester, and 1s. the engine driver, 4s. being quite equal, if not above, what is generally paid, leaving 30s. per day as the working expenses, free from wear and tear, and if I calculate 240 days, at 30s. per day, the annual cost will be 360*l*., which, deducted from 727*l*. 4s., the annual cost of the horses, will leave a balance in favour of the steam engine of 367*l*. 4s., or more than half so much, gentlemen, for a power which consumes nothing when it is not at work! For recollect, you have to keep your horses fifty-two Sundays and equal to twenty-one wet days, making a fifth of the whole year, whilst they are giving you nothing in return. If we reckon only six acres per day on the average for the 240 days, 1,440 acres will be cultivated, or nearly the whole farm twice over. The experience of the past and the present, I mentioned at the beginning of my subject, should point out the most practical and economical method for future observation and guidance, and I think the position which Mr. Fowler has attained, having won every prize that he has contended for, and working on the principle of the endless rope, together with the small amount required in proportion to the work, and the whole of the power rightly applied by keeping opposite to it, places him very far ahead of his competitors. It might be said that I am interested in giving so decided an opinion in his favour; but I assure you, I speak the honest convictions of my own mind, and have attempted to prove as I have gone through this subject "the reason why." But I am not singular in this mead of praise to Mr. Fowler. A thorough practical man writes in the *Mark Lane Express* of January 16th, on the leading features of the Implement department of the Warwick Show: "In comparing the mechanism used this year at Warwick with that employed last year at Chester, we cannot but congratulate Mr. Fowler at the point of comparative mechanical perfection to which—by dint of a persevering labour and an outlay of pecuniary resources worthy of all praise—he has brought his steam ploughing system—a system which, rightly or wrongly, we do not here propose to discuss—Talpa again? —accepting the old plough and its peculiar mode of operation as the best, and as the most economical for cultural purposes, seems to present to the farmer many, if not all, of the points desiderated in practice." One word as to the economy of the roundabout system. To those who approve of this method, I think I have shown them that the triangular system given up by Mr. Fowler in 1856, is far preferable to the square mode of Mr. Smith. If not, I will take a field of 6½ acres square, the furrow will be 8¼ chains in length, and the rope required by Mr. Smith will be 907 yards, and likewise running 4 pullies or sheaves. The triangular system, with horizontal drums, will require 771 yards, 136 yards less than Mr. Smith's, and running only two pullies. Whilst Mr. Fowler's long-range will do the same work with only 370 yards, 530 less than Mr. Smith's, and running only one sheaf, and that his large anchor. This is of great importance when we consider the large amount of power lost by running these pullies, to say nothing of the wear of the rope. Surely I shall not be considered as giving a one-sided opinion, by placing Mr. Fowler in the pre-eminent position that he has attained. In conclusion, I will make a few observations on the benefit the country will, in all probability, derive from steam culture. The Royal Agricultural Society has now been in existence 20 years, and it is really wonderful to look back over this short space and see what has been done for agriculture in the implement department of the trade of this nation. But what eye shall be prophetic enough to look 20 years into the future, and say what shall be doing in agriculture at that period? But it is possible that by that time the bulk of the soil of our country will be cultivated by steam power, and should this be the case, the horses employed in agriculture, which number in amount considerably above 1,500,000, will be reduced to an enormous extent, far above a third, and the food that they would have consumed turned to a profitable account by feeding bullocks and sheep, to the benefit of both the occupier and the consumer, and likewise to meet the wants of our increasing population. But there is a class of men deeply interested in the cultivation of the soil, which this great change will affect either for the better or the worse. The agricultural labourers—how will it fare with them? (Hear, hear.) I have no hesitation in asserting that the more steam engines and machinery are introduced into the agricultural districts, the better it will be for the labouring classes; and if this should meet their eye through the newspapers, I hope they will take a warning word from me, and prepare themselves, by greater application to their present duties, and, letting their mind accompany their work, to fill those higher places which undoubtedly, at no distant day, they will be called upon to undertake. For the superior work they will be required to give they will have superior pay, and, like the artizans, they will become more frequent customers of the butcher; but I hope, in contradistinction to them, their extra earnings may go to the savings' bank instead of the beer house, to form a nest-egg for a rainy day. Thus will the skilled agricultural labourer rank higher in the scale of society, the community at large will have cause to rejoice at an increased supply of the necessaries of life, the farmer will have considerably more to sell of that which turns to profit, he will have a good market from the increased means of the agricultural classes, and all will have to be thankful that the steam engine was placed on four wheels to come to our aid (applause.)

The meeting was then briefly addressed by Messrs. Chandler, Wilks, Franklin, and Hayter, all of whom were replied to by Mr. Williams.

On the motion of Mr. Chandler, seconded by Mr. Franklin, a vote of thanks was passed to Mr. Williams; and a similar compliment was paid to the Chairman.

OPEN COVENANTS *VERSUS* LONG LEASES.

John Grey, of Dilston, is a man who generally speaks with effect. There are, indeed, certain people who are wont to regard him as an especial authority, and to rather play him off against the common run of English farmer. His addresses are prone to be interpreted more as exordiums as to what we should do, than any confirmation of what we are doing. The Southron is told to look at him as a Northern light that is admirably calculated to show the way, and the meetings of the Hexham Farmers' Club have consequently a circulation far beyond the merely local organs, or even the agricultural press. It was only last year that his peace-and-plenty sketch of the butcher's cart calling every day at the cotter's door was criticised the whole kingdom through. In fact, like Mr. Disraeli when he is talking to the independent electors of Buckinghamshire, or Lord Palmerston lecturing the labourers at Romsey, Mr. Grey knows very well by this time that it is not merely his "brother members" who will follow him. Many a London paper has given him a column ere now, and may do so again. However unprepared, then, he may be, or however little inclined to do more than "just to talk in a quiet homely way on certain subjects which interest us all," a certain weight is sure to be attached to what he says. By this, too, experience must have made him sufficiently forearmed to stand answerable for all he advances.

And John Grey is a man really entitled to the position he holds. By education, taste, and gratifying success in the pursuit, his first sympathies are with the farmer. He is a president at their clubs, a judge at their cattle-shows, and, as far as practical knowledge can go, essentially one of them. But with this he has now for a long period united in a great degree the duties and responsibilities of a landlord. As agent or manager of the Greenwich Hospital Estates, he might, indeed, be supposed rather to side with the owner than the occupier. But it is here that his previous experience comes to his aid. It is this that teaches him how to hold the balance fairly, and to encourage the good man and control the bad one. With himself a natural disposition to progress, he feels to the full how this must be brought about. More careful, of course, than an actual owner of the soil might be, he has had to countenance only such a measure of improvement as could be strictly considered safe. His enterprize has had to be continually curbed by his caution, and no experiment has taken so wide a range as even to hazard anything like serious failure. This may be high praise, but it is strictly true. To whatever degree Mr. Grey's instrumentality may have raised the value of the property under his care, it has been at no risk or loss. On the contrary, it came out at the Hexham Club Meeting, the other day, that when he assumed his office on the Hospital Estates the tenants in the North were some six or seven thousand pounds in arrear of rent. At the recent audit there was only thirty pounds outstanding. Better times and better prices have no doubt had a great deal to do with these altered circumstances; but a better management quite as much, or more.

And how has this been brought about? Long leases and liberal covenants, plenty of capital and a high order of intelligence, are the commonly accepted requirements for setting about farming as they do in the North. To the advantage of some of these, at any rate, we are becoming more and more susceptible. The favourite axiom just now in such matters is that you can scarcely give a man too much liberty of action. Let him only bring a good character with him, and something to back it, and then the less you interfere with him the better. In these stirring times, four-course rotations, and such like formalities, are fast going out of fashion; and it is simply an absurdity to bind a tenant down to do as his forefathers did. There seems to us to be a great deal of common sense in such an argument, but our purpose here is more to see what Mr. Grey thinks of it—an authority who, as we have already mentioned, is armed with ample experience to think for both one and the other. It is so that he puts it: "Very much has been said and written of late in recommendation of letting land with free open covenants, leaving without restriction the tenant to do and act as he chooses. There is some foundation for such an opinion; because, if everybody believes, as I do, that the highest state of cultivation, that the most improved mode of farming, is most productive to the tenant, then, you see, in leaving a tenant at liberty to farm as he likes, if he knows that the higher the farming the better for himself, he is sure to farm in that way; and that must be also conducive to the good of the landlord. But I need not tell you that in farming, as in other branches, there are men who fail to do that which is most conducive to their own interests; men who fail, sometimes from ignorance and from want of judgment; some, unluckily, from want of sufficient capital; many, because they are by nature and in their hearts penny wise and pound foolish, and will not extend, with that liberality with which they ought to do, the benefits of their cultivation, which might make them a good return. These opinions, which would lead farmers to do as they pleased, are much more fitted for the system of letting by annual tenure than by lease. If a landlord has a tenant occupying annually, and if he sees that he has got a tenant who is inclined to take an undue advantage of his land by cultivating in such a manner as is not likely to return to the landlord his property in equally good condition as when he let it, and if he sees the man would be inclined to break up a fine rich old grass pasture, because he would have the benefit of a few years' cropping, with very little expense; or if the man be inclined to follow a system of cropping on the best portion of his land, and leaving the inferior, because it would require more cultivation to keep it up to the mark, so that it may be difficult to reclaim; on this the landlord can draw the check cord, and give his tenant notice to quit. It is not so with the landlord who agrees upon a term of nineteen or twenty years. He may make the very best selection possible of a tenant; he may find a man in whom he has the greatest confidence, both for judgment and integrity; but who can tell where this excellent tenant may be at the end of this year, and who may succeed him? Many a respectable man has a profligate son; and leases, you know, are heritable property; and at the death of the tenant the farms may go into the hands of those who know nothing at all about their management."

This certainly appears to us to be taking the case the wrong way. Surely, if immediate control be necessary—if you want a hold on a man—if anybody is likely to do you injustice—it must be such a one who has but a passing and very fleeting interest in your property. There is plenty of precedent on record to show what damage a yearly tenant may do, be he so inclined, before you can possibly get rid of him. The only thing, in fact, that would keep such an occupier at all in check, would be the fear of the covenants he had agreed to, and the customs he had promised to observe. We should be the last to write up stringent conditions for either, but if a choice must be made between the two, as to who should have the more liberty to do as he pleased with the land, we should decidedly give it in favour of the one holding it for the longer term. He has a permanent interest in the place: his own ultimate advantage depends upon his giving it fair play; and no one would suffer so much as himself by adopting any other system. But, further than this, Mr. Grey, as a cautious man, has to guard against the contingency of death, and the succession of a tenant that in the first instance would not have been approved, or trusted to an equal extent. Perhaps, as many will say, you cannot be too careful in such a matter, and hence the necessity for still making a lease more or less dictatorial on the method of cultivation; while those who rely on no such agreement, but go rather on each other's word and honour, have far more freedom and licence to progress with the times. This is in numerous instances the fact; but we scarcely think that Mr. Grey intended to put it so. Here, in the south, much of our best farming is practised without a lease. In the north it is the reverse. But we must hear Mr. Grey out:—"Is it, therefore, reasonable—and every one who hears me will agree with me in saying that to be permanent and useful every agreement should be founded on justice and reason—is it reasonable in such a case that the landlord's property should go into the hands of a person who is not capable of managing it, and that he should have no means of restricting such person in mismanaging and spoiling his property? And these restrictions are more essentially necessary when the term comes near to an end. In such cases, whatever liberty may be given—and I quite agree with the principle that it would be great presumption in any man to prescribe a course of management to be strictly adhered to during the whole course of the lease—yet I contend that it is the right of the landlord, and that he has a right to claim and receive such power over the management as shall, in some measure at least, restore to him his land in an equally good condition as when he let it." Much of this would apply equally to the original tenant as it would to his successor. We imagine that in almost any case certain provision would be made for leaving the land in proper condition. What we the rather complain of, and what strikes us as not quite fair, is that by this showing, a good tenant should be treated and bound down like a bad one, simply from the remote contingency of a change, not necessarily for the worse, occurring.

MORE TALK ON TOWN SEWAGE.

Whatever may be the actual virtues of town sewage it is certainly prolific enough in one way. It affords a positively endless topic for conversation. As with the man who has a crochet about the currency, or who is knowing in horseflesh, or has a turn for the stage, these modern Tarquins never tire of their theme. They never can have enough to say about it. No one yet ever heard or read of a debate on the sewage question, without knowing that it must be a long one. The common rules and observances of society give way before so dire a necessity. Editors succumb; Chairmen of meetings resign themselves to their inevitable fate; and Reporters gird up their loins for double duty. There must be more space and more time allowed. It is still the same overflow as ever. Mr. Alderman Mechi is announced to read another paper on sewage—or sewerage—at the Central Farmers' Club. Just a week or so before the day of meeting, a brother-member, Mr. Halkett, favours us with "a few words" by way of prologue to what is coming on. No one will have been surprised to find this little letter running to four or five columns of closely printed matter. But then it was "all about sewage." Mr. Mechi himself, although it is by no means the first time he has introduced the subject here, arrives armed with a goodly volume, of which, however, he is considerate enough not to read much more than half. The remainder is in appendix, that such as choose can refer to hereafter. Let us say he took something like an hour and a-half out of the evening to demonstrate how town sewerage really affects British agriculture. Having done so, the introducer of the question sits down, and the discussion begins. Now there is a wholesome by-law associated with the proceedings of the Club, that no one but the first speaker shall occupy more than ten minutes or a quarter of an hour in what he has to say. But as it was "all about sewage," laws or by-laws stood alike for nought. Mr. Sidney, who followed Mr. Mechi, spoke for an hour and a quarter at least. He admitted to having "prepared" himself, and people appeared to think it a pity to stop him, even if they had any inclination to do so. And so for nearly three hours the promoters of promising companies, and other disinterested persons in an unusually large audience, were anxiously awaiting an opportunity that was unfortunately never allowed them. The Club has another sound rule, that none but members shall address the meeting, and this was with some difficulty better observed. Mr. Mechi and Mr. Sidney had it, in fact, pretty much to themselves. Such as have paid any attention to the point will scarcely require to be told that all the Alderman advanced the other contradicted. The sewage of towns was "the finest thing in the world for the farmers," and "the biggest humbug out." At the close of the evening the use of town sewage had not been forwarded one iota. For a choice of phrase, the question had been not so much *advanced* as *settled*.

Still it was well handled, and will do no discredit to the society. If, as usual, Mr. Mechi evinced a little too much of the spirit of the enthusiast, he had nevertheless got up his paper with great care, and perhaps said as much for the question as was possible. Mr. Sidney came equally well armed. As a specimen of gladiatorial display, of avowed and effective attack, his was no doubt a very successful performance. He first knocked Mr. Chadwick down, and then fought the Alderman over the body; retiring every now and then to the British farmer for "a knee," but coming again and again very resolutely to the scratch. It would be difficult to describe the set-to in less classical language. With the meeting, however, he had clearly the best of it, and had any formal resolution been carried, it would have been very much to some such a purport as this—That town-sewage might be useful enough in its way for irrigation, but that it would never pay for the farmer to put himself to any great trouble or expense in procuring it.

But whatever the farmers themselves may think, some great authorities maintain the direct converse of such a proposition. The very discussion at the Central Club arose in this way. Towards the close of last year, Mr. Mechi wrote a letter of remonstrance to the *Times*, in which he said: "It is for our landlords and agriculturists to associate their will and means to convey to the land those precious streams which now exhaust our soil, contaminate our rivers, and impoverish our agriculturists, and those dependent upon them." And he backed this up by a quotation from Baron Liebig, on modern agriculture. The Baron was grateful. In due course *he* wrote a letter, that also went into the *Times*, very complimentary in its tone towards the Alderman, but somewhat hard upon the farmer. As, for instance:—"The majority of farmers do not know the extent to which their own interests are concerned in this matter." And, again:—"They think that diligent tillage and good weather are sufficient to produce a good harvest; they therefore regard this question as one in which they are wholly unconcerned, and look forward carelessly and with indifference to the future." That is the kind of thing precisely. The farmer does not know what is good for him. There the ignorant, obstinate lout stands; and they squirt sewage in his face—they pelt him with monster cabbages—they throw tons of Italian rye-grass at his head—they let loose the flood-gates of Edinburgh upon him—they tell him to go to Rugby to get educated, or they will start him for China at once. The Committee of the Central Farmers' Club rather objected to this sort of greeting. At any rate, however little they might actually study their own interest, it should not be said they ever treated the matter with indifference, and Mr. Mechi's proposition was the first they determined upon.

It is pretty generally conceded that if the English farmer was only to do all he was advised, he might soon succeed in making himself eligible for a berth in the Benevolent College. Mr. Mechi then had to meet the matter in this wise. He had to show how sewage might be employed to a profit, and this in the face of a whole succession of failures that have attended our experiments. Chemists seem to agree that in its present diluted state sewage is only a little better than mere water—for the purpose of irrigation, and for that only. How far, then, will the farmer be justified in troubling himself about it? Or, how should landlords and agriculturists associate to secure these "precious streams"? The answer is still wanting. As nearly all the speakers said on Monday evening, irrigation no doubt does a deal of good; but what more than this says Mr. Berry Congreve, who has the sewage of Rugby?—"If that town would give him the sewage, and it would descend by its own gravity over his farm, he would accept it; but that if it was to be first mixed with large quantities of water collected in tanks, and then to be pumped up, it would be valueless. In fact he lost a considerable sum by the sewage of Rugby every year." In plain truth, then, in this matter, once more, the farmers are not blind to their own interest. Had they only done what Baron Liebig and Alderman Mechi ordered, they would, like Mr. Congreve, have been "losing money every year." Any application of the sewage of towns does not, in the first instance, rest with them. It might be of some use if conveniently conveyed, at little or no expense. Corporate bodies, who fancy they are going to take their thousands per annum of the farmers in this way, cannot too soon disabuse their minds of such a notion. Promoters of schemes and associations for the use of sewage must not look to the farmers for shareholders. Sewage and sewerage, as an argument, occupy two very important divisions—the matter itself, and the mode of its application. It is with the latter that our cities and towns have still to deal. The farmer can do little more than bide his time at present. The difficulty is not with him.

LONDON, OR CENTRAL FARMERS' CLUB.

THE SEWAGE OF TOWNS.

The first monthly meeting of the Club during the present year was held on Monday evening, Feb. 6, at the club-house, Blackfriars, Mr. L. A. Coussmaker, of Westwood, Farnham, the new president, in the chair. He was supported by a very large attendance of members and others interested in the question announced for consideration, including Mr. Alderman Mechi, Mr. John Thomas (Bletsoe), Mr. J. Tyler, Mr. James Howard, Mr. J. A. Williams, Mr. Bailey Denton, Mr. J. Bradshaw, Mr. Cuthbert Johnson, Mr. C. J. Brickwell, Mr. S. Sidney, Mr. J. A. Nockolds, Mr. R. Marsh, Mr. Bullock Webster, Mr. N. Leader, Mr. T. Congreve, Mr. J. G. King, Mr. W. Cheffins, Mr. James Wood, Mr. Cousins, Mr. Wood (Croydon), Mr. J. Cressingham, Mr. Fidler, Mr. Murrell, Mr. T. Owen, Mr. J. Odams, Mr. R. Bond, Mr. Shearer, Mr. Halkett, Mr. Goldhawk, Mr. J. Parkinson, Mr. James Thomas, Mr. W. Pedder, Dr. Ellis, Mr. W. Eve (Kent), Mr. Eve (Broad-street), Mr. Christie, Mr. G. P. Tuxford, Mr. Coleman (Beds), Mr. R. Palgrave, Mr. Lutley, Mr. R. P. Browne (Greenwich), Mr. Keep, Mr. J. Medworth, Mr. Coleman (London), Mr. Edmonds, Mr. Trevethick, Mr. Hooker, &c., &c.

The subject for discussion assigned for its introduction to Mr. Alderman Mechi, was "The Sewage of Towns, as it affects British Agriculture."

After a few introductory remarks from the Chairman, Mr. Alderman MECHI said:

The question, "How to Manure our Lands abundantly and cheaply," is well deserving consideration in a country like ours, where nine-tenths of a rapidly increasing population are non-producers in agriculture, and where the great competition for land, and its consequently increasing rental, necessitate a much higher rate of production. I am quite aware that, by many, I am looked upon as a public bore, always agitating about sewage and those nasty excrements; but such people cannot be aware that the production of their daily bread depends upon the economizing of those very excrements, by their application to the soil. Anything that I can urge in this matter can add little to the force and truth with which Baron Liebig has recently invested this important question. I shall show, by a statistical review of our past and present sewerage, the enormous recent multiplication of the system, and the consequent new and greatly increasing danger to the people of this country by the much more rapid exhaustion of its manurial resources. The publication of Baron Liebig's important warning to the British people, on the ruinous waste of the manurial elements which should produce their food, has attracted much attention, and caused a considerable discussion of the sewage question. In the editorial remarks and various criticisms that have followed upon the Baron's letter, it has been very generally, but erroneously, assumed that the waste of our excreta, by discharging them through sewers, is an old practice, that our soil has not in consequence become exhausted, that, therefore, the warnings of Baron Liebig betray exaggerated fears, and that we may go on in our present course without injury to British agriculture. My object in reading this paper is to refute these mistaken assumptions, by showing that excretal sewers are of very recent formation, and that, until lately, nearly all the refuse of our towns and cities found its way back, most properly, to the land, thus maintaining its fertility and preventing its exhaustion. Those who believe in perpetual fertility should remember how small was our population previous to the present century, and therefore how limited were the demands upon our soil. Although there was no census of the population of the last century, we may assume its average to have been 6 to 7 millions—a large portion employed in agriculture. From 1700 to 1764 we exported, annually, from 100,000 to 950,000 quarters of corn, and from that period to 1784 our exports very nearly balanced our imports. Now we import 12 millions of quarters annually, and our population approaches 30 millions. During the last century much of our country was in permanent pasture, which we all know is not exhausting to the soil, provided the produce is consumed on the spot. I have been favoured by various civil engineers with copious statistics of the date and extent of sewerage in our principal towns and cities. Their evidence is unmistakable that it is only within the last fifteen years that we have had, to any extent, sewers for our excrementitious deposits. Since the establishment of Sanitary Boards, excretal sewers have multiplied tenfold. The first water-closet was made only forty-five years ago; and although the city of London was foremost in sewers, it had only seven miles of sewers in 1800—now it has 49 miles. The few sewers that did exist in the last century were for carrying off water, for it was strictly forbidden to throw excrementitious matter into them. As to the metropolis outside the city, Mr. Bazalgette writes to me: "Up to 1847, the management of the metropolitan sewers was in the hands of seven separate commissions of sewers, who have left no records from which we can obtain the information you desire; but up to that period very little house-drainage had been constructed." Mr. James Newlands, borough-engineer to Liverpool, says: "In 1830, the commissioners commenced making sewers, and in ten years completed twenty miles. In 1842 they commenced making ten miles more; but these sewers were merely for the surface-water of the streets. Drains from houses were not allowed to be connected with them; and thus, for the purposes of health, they were a mockery. The Liverpool drains and sewers had increased in 1847 to 53 miles, in 1858 to 201 miles, and house-drains connected with them." I could multiply these proofs from most of our towns and cities, but enough has been shown to convince us that it is only within the last ten or twelve years that the gigantic waste of our manurial resources has taken place. In former times, the oldest of us may well remember the night-carts emptying cesspools after midnight. The contents of these, mixed with ashes and other refuse, found their way, by canal or coaster, a hundred miles into the country. Even now, many cargoes of London manure are brought down to the coast, 100 to 150 miles, and paid for by the farmers at about 7s. per ton. A large farmer-friend of mine, ten miles from Reading in Berkshire, used to send his carts four or five times a week to that town for night-soil. Now, owing to the new sewer and sanitary arrangement, he only sends his carts once a week, and is thus deprived of four-fifths of his manurial resources. Multiply his case by many thousands, and you may then estimate the losses caused to agriculture by the new system.

The effect of steam-power in multiplying our manufacturing, commercial, and trading greatness and population is astounding. In 1700 Liverpool was a place of mark, containing 4,240 inhabitants: now its population is near 300,000. Manchester had 12,000 souls in 1700, and 400,000 in 1851. The same remark applies to our other hives of industry. At that period the population of London was mainly within its old City walls, probably 150,000; now it approaches three millions. Under our old cesspool system, increased population brought us an increased amount of manure and of food; now it has an opposite effect. Well, then, if all this be true, it is quite clear that our demands upon the soil of Great Britain must have multiplied with its population, and that the frightful waste of the manurial residuum of our food is too recent to make us yet feel, in their full force, the disastrous results of such a ruinous system. It is generally admitted by scientific men that the sewage manure is worth preserving, and that its annual value must be very great; "but," says the editor of the *Times*, "will Baron Liebig and Alderman Mechi tell us how it can be utilized?

The effect of a short supply of food in diminishing population is sternly shown by the following statistics of Irish population after the famine. In spite of English aid it rapidly declined, whilst that of England was fast increasing. You cannot in an old country have food without manure; therefore to waste your manure is to deprive your country of food and of population. The population of Ireland in 1821 was 6,801,827, in 1831 7,767,401, in 1841 8,175,124, in 1851 6,551,970.

The real difficulty of the question does not consist in the conveyance of the sewage to the farmer's fields, but in conveying to his mind, and to that of his landlord, the conviction that it will be necessary and profitable to him to avail of it. Farmers, as a body, have no faith in liquid manure, and are not, probably, aware, that twelve parts out of thirteen of their own manure, and that of all their animals, are deposited as urine. The sheep-folding, deprived of its liquid, would be almost worthless. It appears to me that the only way to remove or overcome this difficulty will be for any company that may undertake this scheme to show the effects of the town sewage on small plots of ground in various parts of the country through which their pipes may pass, or otherwise offer such inducements for trial as may tend, by their results, gradually to remove this unprofitable prejudice. On sloping grounds below the reservoirs it might flow over the surface, as in ordinary irrigated meadows, thus saving the farmer the expense of subterranean iron pipes. No one can reasonably doubt that

The Great Want of British Agriculture is More Manure.—Evidences of this are to be seen from every road and every line of railway, and yet we are annually multiplying our waste of what may be truly called the life-blood of production. One class of reasoners console themselves with the new source of fertility developed by deeper, cheaper, and more perfect cultivation by steam power; but is this to justify the waste of our manures? Would not these more deeply cultivated soils gratefully absorb the contents of our sewers? Does not every farmer know that the poor (because undisturbed) subsoil demands immediate and abundant supplies of manure? I am a good deal amused at the great change which is coming over the general agricultural mind with regard to the subsoil. I have not forgotten how often I was censured, years ago, for introducing that nasty stuff to atmospheric influence. Drainage and steam cultivation are doing much to remove this prejudice. But supposing that I shall, in the course of this paper show that the sewage may be brought to the aid of agriculture,

How am I to convince agriculturists of the value of the sewage? How shall I present to their minds, by illustration, the loss they suffer annually by its absence? Assuming that the fifteen millions of population who inhabit our towns and cities produce excrement, and other elements of manure, equal to those of twenty millions of sheep, what would farmers or their landlords say, if farmers, having fed twenty millions of sheep and lambs day by day, their manure was to be daily thrown into the river, instead of being deposited on the fields? What would be the loss to agriculture of the folding of twenty millions of sheep daily? Would it not bring poverty and ruin to British agriculture? Every farmer of the plainest capacity can understand this, but can he not understand that the loss from twenty millions of human beings is nearly equal to that from twenty millions of sheep! Can he not imagine what would be the result to British agriculture of this additional daily folding of twenty millions more sheep, or human beings, on the fields of England? Should he not picture to himself the deposits from twelve millions of quarters of foreign corn which we import annually, and which ought to add enormously to our manurial resources? Where would, then, be the residuum of the thousands of cargoes of consumable articles which enter our harbours from foreign ports, and from our colonial possessions? Every farmer should have, framed and glazed, the variety and grand total of our consumable imports, and an estimate of their manurial value. How much would this economy save the British farmer, by rendering less necessary the purchase of oilcake, bones, guano, and feeding-stuffs, which are heavy deductions from his farming profits, but which he must purchase, to compensate in some degree for what is wasted in our sewers? If the money value of the contents of our sewers could be shown to the British farmer in bright and glittering heaps of sovereigns, he would grasp at the enormous wealth, and make great efforts to obtain it. Our sewage, although less perceptible a treasure, is not the less a real one. I am bound, in truth, to say, that I have not seen any practical desire or effort, on the part of British agriculture, to obtain this treasure. If it is worth having, it is worth asking for; but it has not been asked for, and the apathy and miscalculation on this subject must amaze every unprejudiced man of calculation. Is human excrement less valuable than that of animals? In looking over the balance-sheet of the London General Omnibus Company, I saw that they had received between £2,000 and £3,000 for the manure from their stables for one year. Is this no indication of the agricultural loss? Watch one of our recently swept thoroughfares, and, ere the sweepers have well departed, see it again covered with animal ordure. Well may our friend Chadwick (to whom we owe so much) say, that the streets of our towns are the horses' waterclosets; and truly does Mr. Shepherd say, that the first half-hour's heavy rain washes from our streets manurial treasures, organic and inorganic. The value of human excreta is further shown by the following letter:—

"Munich, January 8, 1860.

"Dear Sir,—I had the pleasure of receiving your favour of the 2nd inst., and am longing for the realization of Mr. Shepherd's plan, hoping it may receive the support it deserves from the public.

"I presume Mr. Shepherd has taken into consideration the difficulty of applying the sewage water to the lands and fields at all periods of the year. Consequently very large tanks will be required for retaining stock to apply it when needed. There may be some loss from leakage, but this will gradually cease as the matter becomes deposited. The putrid or offensive exhalations from the sewage in the tanks cannot be avoided during the hot weather, unless your deodorising fluid, the perchloride of iron, be applied, and with advantage, in order to prevent a nuisance which would otherwise arise.

"I thank you very sincerely for the support you have given to my ideas in the *Standard*, but I fear it will cost you all a vast deal of trouble in order to overcome the *vis inertiæ* f the public.

"The contents of the reservoirs of the fortress of Rastadt, in the Grand Duchy of Baden, which received the deposits of a garrison of 8,000 men, were sold in 1858 for 8,155 florins. The commune of Oligheim, near Rastadt, consumed the greater proportion of this sewage, and in the course of a few years they converted the most sandy unproductive soil into flourishing corn-fields.* Now, what can be done with your sewage has been demonstrated by Mr. Mechi, on his farm at Tiptree Hall.

"Receive, dear sir, the assurance of my esteem, and believe me to be faithfully yours,

(Signed) "J. VON LIEBIG.

"Charles F. Ellerman, Esq., London."

How Farmers would Benefit by Town Sewage.—If farmers depended entirely on the sewage of towns for the supply of manure, it is quite clear that they might be permitted by their landlords to sell off, without damage to the land, their hay, straw, root and green crops, provided they could find a market for them, or provided it was more advantageous to them than feeding cattle. They might also grow hemp, flax, rape for seed, potatoes, mustard, and other crops, which would be considered, under our present system, scourging or exhausting. Provided an abundant supply of town sewage were annually used, it would be impossible to exhaust the soil by any cropping; and our farm leases might be a great deal shorter than they are at present. The generality of farms are now only manured once in four years. Such a system would suit farmers of limited capital. The only excuse for treading our straw under foot, and consuming, hay, straw, and green crops on the farm, is to produce manure to grow the cereals. It is quite clear that as sewage manure contains *all* the elements of *every* crop that can be grown, we need no longer feed out oilcake at a loss, or pay away our money for guano, bones, blood, and other manures. Those who will read Fortune's, Davis's, and Oliphant's recent books on China will see that it is almost entirely by the use of human excreta that the 412 millions of Chinese can obtain their food. How much is their example in this respect needed by us, under our new sanitary arrangements!

Where the Movemont is Taking Place.—Although farmers and landlords have done little or nothing as regards the sewer movement, it is gratifying that several public bodies connected with lunatic and charitable asylums are applying the sewage and waste of the numerous inmates to agricultural production. This has been successfully done at the Colney Hatch Lunatic Asylum, and is proposed for the Royal Victoria Patriotic Asylum, near Clapham Common, and some other institutions. When our prison discipline is connected with agricultural labour (as I trust some day it will be), we may hope to see the "avails" of our criminals applied to the soil. The Messrs. Harvey, of Glasgow, who have over a thousand cows, still continue to force the sewage out of town to their farm, which supplies early and abundant resources of green and root crops. At Mr. Kennedy's and Mr. Telfer's farms, in Scotland, the irrigation is continued. We should never forget that the sewage system at Messrs. Harvey's, of Glasgow, was suggested and carried into operation by that far-seeing and excellent friend to agriculture, the late Mr. Smith of Deanston, whose views (I know by frequent personal conversation with him) were very early and very strongly in favour of sewage applications. Agriculture owes to his memory a debt of gratitude. Lord Essex's experience with the Watford sewage is important. The difficulty to which I have just referred has an important bearing

On the Terms of Contract between Sanitary Boards and Sewage Companies.—It is quite clear that, until a change is effected in the agricultural mind, sewage companies, formed for its general distribution, must be great experiments. As such, they should in the first instance be encouraged, and even probably subsidized by the towns for the first few years, no charge being made to them for the sewage. In course of time, when the operation shall have resulted in good dividends to the shareholders, the sum to be paid to the towns might bear an equitable relation to the per-centage of profit realized by the shareholders. Except by such an arrangement, capital will not be advanced for such companies, for it will take some years to convince agriculture that she will be benefited by using and paying for town sewage. If landholders desire to prevent the exhaustion of their soil by the restoration of the sewage, they must give practical evidence of that desire, by taking shares in, or giving other facilities to, any public companies who shall devote their capital to such an object. Some years ago a company was formed, to pump sewage from the Counter's Creek Sewer to the market gardens at Fulham. This was like "carting coals to Newcastle," for we all know that the soil, naturally very fertile, receives annually, per acre, from 50 to 100 loads of London stable-dung, which is brought back free of cost for carriage, by the carts that have taken the vegetables to London. It is on the poor soils, beyond this influence, that the water and sewage will be profitable. I foresee that the time will come when the

Towns will derive a large revenue from their sewage; but that can only be when agriculturists have tested its value. In order to induce them to do this, every temptation and encouragemant must be offered to them, and to those companies who propose to supply them.

Influence of Sewage Manure on my Farm Profits.—I am much indebted to the sewage system on my farm in this respect—for the last six years my gain as landlord and tenant on my little farm of 170 acres has been nearly £700 per annum. Even this last year, with wheat at 42s. per quarter, I have gained £600 after paying every expense. Of course much of this benefit has arisen from steam-power, drainage, deep cultivation, and other improvements; but the liquefied manure system has greatly contributed to this result.

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* I infer from the Baron's letter that this sewage has been purchased annually, and used for several years previous to the above date.

How this Sewage is to be got upon the Land.—The engineering difficulties are, I have reason to know, not considerable. There is nothing better known than the cost of delivering water or sewage at certain heights and distances. Our great Cornish pumping engines have their performances most accurately registered. A score of them would make child's play of our London sewage. Some of these engines raise a column of water 1,200 feet high. Besides, we know accurately the amount of steam-power used, to supply these 80,000,000 gallons of water daily to the metropolis. How erroneous is the supposition that our town sewage cannot be availed of in its present form! It is already in operation at Watford, Rugby, and other places. Wherever disappointment has arisen, it has been for want of carrying out the machinery and piping in accordance with hydraulic science. The Serpentine, in in Hyde Park, would just hold one day's London sewage without rain-fall. Two tons of coals in a Cornish engine would suffice to empty this Serpentine. One inch depth of water will be 101 tons 5 cwt. 2 qrs. 21 lbs. per imperial acre. Sewage weighs heavier than water, according to its saturation. The sewage of London taken at 60,000,000 gallons per day would fill a canal 10 feet wide, 4 feet deep, and 45 miles 500 yards in length, every 24 hours. I would commend to your notice a very able pamphlet, by Mr. Shepherd, C.E., published by Effingham Wilson, Royal Exchange, on this question of applying sewage. He is trying to establish a company for this purpose. Mr. Shepherd's plan is to have reservoirs on the highest districts always charged, like our water companies, and main supply pipes under the common roads. The farmer would then only have to connect his hose and turn on the tap, and he might at any time apply the fertilizing stream to his fields; he would require no tank or steam-engine for this purpose, the pressure being always sufficient to give him an ample jet; or he might diffuse it without pipes, over his sloping grounds, like common irrigation.

The Condition in which Sewage should be Applied.—This question I consider finally settled by Professor Way, in his admirable paper "On the Use of Town Sewage as Manure," published in 1853, in the Journal of the Royal Agricultural Society of England, vol. xv., p. 135. Every one interested in this question should carefully study that comprehensive and convincing paper. He says—"I feel that no other than the liquid method can finally satisfy all the necessities of the case;" and he says, "but there are always two parties to a bargain; and until the agricultural community is prepared to use liquid sewage, it is of no avail to offer it." Again he says—"Each individual of a population will, in the course of 24 hours, contribute to the sewage of a town ¼lb. of solid, and 3lbs. of liquid excrement." In addition to the valuable human and animal excrement, the rains wash from our granite and other pavements salts of potash, magnesia, lime and soda, also sulphuric acid in the form of sulphates—all exceedingly valuable to vegetation. Professor Way continues, "The appearance of London sewage water, as it issues from the mouths of the sewers into the Thames, is very different from what most people imagine, and by no means so repulsive. The great distance which it has, on the average, to flow, over a rough surface, the angles it has to turn, and the immense friction and agitation derived from these circumstances, form together the most perfect means of its disintegration; so that on its arrival at the mouth of the sewers no visible trace of its origin is to be detected. A glass jar of London sewage at the outfall is only a slightly turbid liquid, with a flocculent, slimy, fibrous matter floating through it. It has a putrid smell, but by no means so bad as would be expected, the chief odour being that of sulphuerted hydrogen. The great nuisance of all sewage, when thrown into rivers and water courses, is the accumulation of the solid matter which takes place on the banks of such streams, and which in its decomposition is always giving out noxious exhalations; the liquid itself, when mixed with a large body of water, is too diluted to give off any great smell." The important soluble manures are conveyed to every portion of the soil and subsoil, and become condensed on the surface of each granule of soil ready for the rootlets of plants. [See Liebig's recent discovery]. In grass lands the excretions from the growing plants are removed or decomposed by sewage irrigation, much to the advantage of the growing plants. [See Liebig on Modern Farming]. There is no waiting for a shower, thus avoiding loss of growth at the critical season. As a rain-fall of 1 inch is 100 tons per acre, the London sewage would add considerably to the annual supply of moisture. Everybody can see the effect of a rain-fall of even a quarter of an inch, or 25 tons per acre, on a warm day in the growing season. I have seen farm-yard manure undissolved in the soil even 12 months after its application.

The Extraction, in a dry condition, of the valuable elements from the sewage has not yet been satisfactorily accomplished, farmers declining to purchase the residuum at a remunerative price. Recent experiments with per-chloride of iron have been reported upon by Dr. Hoffmann to the Metropolitan Board of Works, as being more successful than former experiments with other substances; but if Dr. Letheby's table of deodorizing cost is correct, we must give up all hope of getting London excreta in a solid form. My own opinion is decidedly in favour of its application as sewage, as a matter of economy and profit. Water has a natural and powerful affinity for the soluble and best portions of manure; hence the inefficiency of costly deodorizers to abstract them from sewage. But earth has a stronger attraction than water for those soluble treasures; therefore it acts the part of a great fixative filter, which robs the liquor of its fertilizing ingredients, and stores them up for the growth of vegetation as food for man and beast. This is well known to Baron Liebig and other chemists, and has also been recently proved by Professor Voelcker's experiments with my own stiff clay and my liquid or sewage manure, [see last number of Royal Agricultural Society's Journal.] Those who believe, as I do, in Baron Liebig's great mineral theory, will easily comprehend that the large quantities of soluble alkalies, and earthy phosphates and sulphates, detached from our granite and other pavements by frictional trafic, must be, when separated from the sewage by earthy filtration, necessary and beneficial to vegetation.

How much dry solid Matter is there in the daily Excreta of 2,500,000 *People? (the Population of London.)*—As very exaggerated and erroneous notions prevail, even amongst engineers on this subject, I must again refer to Professor Way's statistics, "Royal Agricultural Society's Journal," Vol. 15, p. 135. By those you will see that

	Tons.
The fæcal discharge of a quarter of a pound per day for each individual is............	277
Deduct moisture, 75 per cent.	208
Dry solid matter from the solid manure of 2,500,000 people.....................	69

The urine of 2,500,000 people, at 3 pints or 3lbs. per day each, will be 3,348 tons of fluid daily; but as this urine contains 3 per cent. of dry solid matter, you will no doubt be surprised when I tell you that this liquid excreta contains 104 tons of dry solid matter, or 50 per cent. more than is contained in the so-called solid fæcal excreta. These excretal matters are mixed in the closets and sewers with about 214,000 tons of water, the remains (after evaporation, &c.) of the daily supply of 80,000,000 gallons to the population. The rain-fall would be a large addition to this. The quantity deposited by the 60,000 horses and other animals in London cannot be so accurately ascertained, but enough has been stated to show how suitable is the fluid condition to its transmission to any distant point, and to its subsequent entrance into the soil and subsoil as food for plants. This is consistent with the facts on my own farm, where, after applying to the soil, by hose and jet, large quantities of animal excrement, mixed with water, there is no perceptible indication on the surface of any solid matter having been applied. Mr. Lawes, in a very able and voluminous paper on sewage, read before the Society of Arts, March 7th, 1855, suggests that not less than 20,000 acres of grass land should receive the whole sewage of London, and that 10,000 tons per acre might be applied with advantage. This would be equal to a rain-fall of 4 years, or 100 inches. He also anticipates a rental for such land of £20 or £30 per acre. His paper is well worth reading. At Edinburgh, as much as 6,000 tons per Scotch acre are applied; and I believe it is less diluted than the London sewage. In such extensive dressings there must be much waste and nuisance; besides, it is highly desirable than over an extensive area, irrigated land should be occasionally broken up, and thus afford ample and frequent cereal crops. I consider, however, that Mr. Lawes has much undervalued town sewage, and that the area of distribution should be far greater than he recommends. He appears to have placed no value on the water alone, as a fertilizing element.

How many Acres would the London Sewage fertilize?—Cost of Application—Prospect of Remuneration to a Company.—Before this question can be answered, we must settle whether we are to manure for a rotation of ordinary farming crops, or to produce enormous crops of Italian rye grass, pasture, root, and other green crops, for the production of meat and dairy produce. These green and root crops would absorb an enormous supply of sewage—probably as much as 1,000 to 3,000 tons per acre; but, in preparation for the alternate mode of ordinary cropping, 200 to 300 tons would be a more suitable dressing. 2,000 tons would probably be equal in value, for green crops, to one ton of guano; and, at one penny per ton, would cost only half its price. I am aware that Mr. Lawes and Dr. Gilbert have estimated it at a lower value than this, but they took no account of the bulk as rain-fall. Now 2,000 tons per acre are equal to an additional rain-fall of 20 inches (nearly a year's supply); and we all know the value of moisture for green and root crops, and we also know that guano, or any other manure, is valueless without water. It would be, doubtless, much to the advantage of the company to supply large quantities on a limited area, as demanding a shorter length of mains and branches, although they must be of a larger diameter. If treated on the rotation principle, one million of acres would not be too large an area, as only the half not in corn, or 500,000 acres, would require, annually, an irrigation of 300 tons; but, on the forcing green crop principle, about 80,000 acres, at 2,000 tons per acre, annually, would take the whole London sewage of 500,000 tons per day. Mr. Telfer, of Cumming Park, Ayr, tells me that he applies 500 tons of water per Scotch acre, at five dressings, to his Italian rye grass, with 500 cwt. of guano at each dressing, making a total annual application of 25 cwt. of guano per Scotch acre (one-fourth larger than the English acre.) In addition to the guano, the excreta of his 40 cows are mixed with the 500 tons of water. This is high farming, but then, with only 50 Scotch acres, Mr. Telfer keeps 40 dairy cows and grows ample produce besides—*and makes it pay well.* What a small proportion his rent must bear to his produce! In considering *where* the sewage should be applied, I should select poor and barren districts, which, under its influence, would, like the once barren Edinburgh meadows, soon become fertile districts; and it would be well to choose places beyond the reach of the returning dung-carts. But it is to be remembered, that much of our grass land, in the vicinity of the metropolis, would be enormously advantaged by liberal supplies of fluidized manure, during the spring and summer, particularly where the cows are grazed.

The cost of application, within a radius of 30 *miles*, should be one penny per ton. To cart it by road that distance would cost one pound per ton. A grass farmer requiring 1,000 tons per acre would thus have to pay £4 3s. 4d. Had he my experience of sewage, he would rejoice in the results by a more than a doubled hay crop, and abundant feed.

Would it pay a Company to deliver the Sewage at One Penny per Ton?—In order to arrive at sound approximate data on this point, I have minutely investigated the Blue Books containing the detailed workings of our nine metropolitan water companies, and find, that in 1849 their consumption of coal for pumping was, for the year, about £10,000, and the quantity of water delivered, nearly 18,000 millions of gallons. This year the probable supply of water will be double that quantity, say 36,500 millions of gallons, or 100 millions of gallons per day; and the cost of coal for the year about £18,000. Now, if the Sewage Company are to deliver this water supply (minus one-fifth for evaporation, &c.), and, in addition, a considerable portion of rain-fall, equal in total quantity to 500,000 tons a day, their coals for pumping would cost them £100 per day (£36,500 per annum), or one-twentieth part of a penny per ton, leaving 19-20ths of a penny per ton for other expenses, and profit on investment. I have allowed for a liberal supply of coals, seeing that the Company would have to employ greater force, to convey the sewage to the distant districts.

Assuming that they supplied 500,000 tons of sewage daily at 1d. per ton, it would amount annually to	£760,416
Deduct coals for pumping..............	36,500
Leaving..............	£723,916

to pay working expenses, and interest on investment. From my knowledge of piping and pumping, I can safely say that it would leave an ample profit on the necessary investment, if judiciously and economically managed. An investigation of Appendix No. 1, General Board of Health Report on the supply of water to the metropolis, published by Clowes and Son (1851), would reveal the astounding number of stand-pipes, fire-plugs (one company alone has more than 10,000 of these), of trunk and other mains, branch mains, side services, and services for small streets and courts—together between 4,000 and 5,000 miles of piping—forming an intricate maze of obstructive angles, compared with which the delivery of sewage to farms would be child's play. The quantity of engine power used and kept in reserve by the London Water Companies is about 7,800 horse. This large supply is not always in use, but meets the contingency of fluctuating demand, varying with time of day and season. To a certain extent, the same principle will apply to a sewage company, even with greater force, on account of the abundant rain-fall, which is too precious to be wasted. A capital of two millions would be ample for any company undertaking to distribute the London sewage on an area of 500,000 acres. I arrive at this conclusion when I find that the capital of the nine Water Companies which supply the great metropolitan area only employed, in 1849, a capital of £4,865,800, now probably increased to 5½ millions. We can understand how much cheaper a single company could be worked than these nine separate establishments; much of their investments having been made at ancient periods, and at much greater cost than the present state of science and manufacture would justify. The area of water supply in London is 90,000 acres, independent of the distant rural pumping engines, and pipes must be carried into every street, square and alley, at an enormous expense; but the town sewage supply would only touch each farm, over an area of 500,000 acres. The farmer's or landlord's cost for piping the farm would, according to the irrigation on my own farm, cost about £2 per acre. It might be worth consideration whether the company should do this, charge a per-centage, raising additional capital for the purpose.

By irrigation with sewage, our water supply will be preserved, in spite of the great demands made upon it by our numerous steam-engines, by our more perfect agricultural drainage, by our railway cuttings, and, above all, by the enormous requirements of our new sanitary and water-closet arrangements. The inconvenience of an insufficient water supply has already been very generally and very severely experienced. The re-application of the water to the soil, in the form of sewage, if judiciously spread over a sufficient area of land, will replenish our springs and rivers. Few people have an idea of the amount of water consumed daily in our fixed manufacturing engines and locomotives. It amounts to four millions of horse-power; and as each horse-power is represented by the evaporation of 1 cubic foot, or 6 gallons of water, per hour, it follows that our total consumption in this way is 24 millions of gallons per hour during working hours! This is independent of our river steamers, which I have not reckoned. Owing to our improved and increasing agricultural drainage, the ground becomes warmer, and, therefore, evaporates the rain-fall much more quickly than it used to do. The same drainage promotes a more abundant and leafy development of plants, with increased evaporating surfaces; so that we lose our water supply in a variety of ways, to say nothing of the increased consumption and evaporation by an extra twenty millions of people and proportionate number of animals. The removal of our wood and trees is said to materially diminish the rain-fall, and promote the circulation of air, and, consequently, thus increases evaporation. In order to meet the variations of supply by rain-fall, and to suit the demand to the different seasons, it would be desirable to have, by means of the powerful steam-ploughs and subsoilers, an ample acreage of poor hungry upturned subsoil, that would appropriate and gratefully pay for an immense supply of sewage, when, from growing crops and other circumstances, it could not be conveniently applied to other lands. Such soils would probably pay for 2000 tons per acre, or even more. I speak guardedly on this point from practical experience on my own farm, for I never could make too rich the condition of my soil for Italian ryegrass, root crops, pastures, cabbages, beans, and peas. It is only when the mere shallow-ploughed crust is over-gorged with manure, as at Vaujours farm, that crops are overdone and fall; but sewage, on deeply-drained land, descends deep into the subsoil, and thus gives length and depth to the roots, with stamina to the plants. From the 1st of May to the 20th June, or during the growth of grass for hay, the feeding pastures and meadows would receive the sewage in great abundance, for cows and other stock will feed readily on irrigated grass land, even where, twenty-four hours previously, the strongest sewage has been applied. It is, however, preferable to interpose a few days between the irrigation and feeding. During frosty weather the sewage might flow over open-guttered districts, as the gutta-percha or India-rubber tubing would get frozen. The temperature of sewage, by fermentation, is always warm enough to find its way into the soil by thawing the surface.

Will the sewage be a nuisance after it has passed through the soil? An unfounded fear exists that we shall poison our brooks, springs, and rivers by the application of town sewage to the land. Now that depends mainly upon the extent of area to which you apply it. We all ought to know that the only available deodorizer on a large scale is the earth. If I receive a box of grouse or a haunch of venison that is somewhat tainted, I wrap it in a cloth, and bury it in the soil. On exhuming, it will be found perfectly sweet. It is in the soil you must bury your sewage, if you wish to sweeten it. In fact, Baron Liebig has shown us, in his last able work on modern farming, that the soil instantly separates and appropriates, by condensation, on the surface of its granules, all the valuable elements that the sewage contains. What becomes now of the manure from the farmers' 30 millions of sheep, and proportionate number of bullocks and horses, equal in manurial results to double our population? Is there no smell in farmyard manure? And are we to forbid its application to the soil? There are 50 millions of acres under cultivation; of these, one-fourth are manured annually with 15 tons of farmyard manure per acre, making a total of 187 millions of tons! What was the state of our rivers and brooks when all the night-soil of our towns was applied to the soil? Where are the washings of the 200,000 tons of concentrated bird's-dung (guano) which enter our warehouses, and are then spread broadcast over the land? Where the tens of thousands of tons of blood, bones, artificial manures, and other abominations, so extensively used by farmers, and so necessary for the production of our food? In certain districts, within ten to twenty miles from our coast, the fields, at certain seasons, are manured with sprats, starfish, mussels, and other garbage in a state of decomposition, which you may smell for miles; and in August last, when visiting the north of Ireland, the fields were covered with flax, spread out or grassed after steeping, giving off the most disagreeable effluvia. We may be more nice than wise, and, in consequence, go without our dinners. But what actually takes place now in our rivers, and especially in our noble Thames? Oxford, Reading, Windsor, and numerous other places pour their excreta into it, by the new sanitary arrangements; and when it comes to Hampton, the gigantic pumps of a water company send it to us in London to drink. Man is foolish, but the Almighty is wise. Provision is made in the plants to appropriate these manurial deposits. The water-plants feed on them, and grow strong in consequence.* It is only when the dose of manure is too strong that water-plants, like land-plants, are destroyed, I remember the time when salmon were caught in the Thames and the Lea, smelts at Blackwall, and roach at Blackfriars; but we have overdone the dose, destroyed the purifying weeds, and driven away the fish, at all events nearly as far up as Richmond. Beyond that, although the river has received the manure of many towns and cities, the water is transparent, and fish abundant. When I passed Twickenham last summer, leaning over the bows of the "Maria Wood," I could see through the pellucid water the lively fish, the waving weeds on which they feed, and clear pebbly bottom of the river. We need not, therefore, alarm ourselves about the disagreeable results of applying the sewage of our towns to an extensive agricultural area. Science has taught us that water and marine plants get their food from the aqueous medium in which they grow. Whole generations of marine animals and fish, with their excreta, become, in solution, food for those plants from which their own nutrition was directly or indirectly originally derived. The great sea-weeds, as long as St. Paul's is high (see Darwin), take their food from the surrounding elements, organic and inorganic, held in solution by the sea-water. Probably our marine vegetables and animals equal in bulk and quantity those of our terrestrial surface. In the vast ocean, the hand of man is not required to manure or cultivate. The vegetation in the ditches through which the sewage flowed would grow luxuriantly, provided it were not too concentrated.

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* I was very much astonished that Mr. Bidder, the President, should have made the following remarks in his recent opening address to the Society of Civil Engineers: "Another feature in the drainage of towns demands attention; that is, the prevailing fashion of subverting the cesspool system and of introducing outfall sewers. One great inducement hitherto held out has been the prospect entertained of employing the sewage for the fertilization of the neighbouring land. Losing sight of the beneficent provisions of Nature for avoiding pestilence, it was assumed that the sewage of towns would necessarily be of a highly fertilizing character; and it is mainly due to the exertions of our member, Mr. Hawksley, that this delusion has been, to a great extent, dispelled. Recent investigations have shown that, in towns amply supplied with water,

The rain-fall or storm-water of London must at times be very valuable, especially those hasty storms after dry weather. Taking the area of the metropolis at 144 square miles, 92,160 acres, the annual rain-fall at 24 inches or 2,400 tons per acre, the total would be 221,184,000 tons. The rain-fall would thus appear to be nearly twice as great as the water supply. Mr. Bazalgette, in a paper read before the Society of Civil Engineers, on the 31st of January, 1857, tells us that in 1855 there were—

226 dry days in the year,
90 days on which the average amount of rain-fall varied from the smallest fraction to the tenth of an inch per diem.
21 days on which from one-tenth to one-fifth of an inch of rain fell.
28 days on which there were heavy rain-falls.
365

It is thus evident how much of the sewage may be rendered available, and particularly during the warm growing months, when the grasses demand an abundant supply of food and moisture. Of course during very heavy floods some of the manure would be unavailable. Mr. Bazalgette says, "Heavy storms occur at distant periods only, and are of short duration; but the bulk of the waters produced by them is enormous, compared with the flow of sewage in dry weather, and with the quantity discharged during ordinary rains."

Why was there always corn in Egypt? Because there is irrigation from the overflowing of the Nile. I am told it never rains in the interior of Egypt. It is a singular contrast, that whilst we, as a food-desiring people, place no value on the water, much less the excrements, of our great cities, the Egyptians are importing British coal at 40s. per ton, and costly steam and pumping machinery of British manufacture, for the purpose of raising water to irrigate those lands over which the Nile does not flow, and thus produce plenty of corn for the British market. Although we have not the amount of sunshine to force two cereal crops annually, we can always vie with Eastern countries in meat-making grasses and succulent roots. The water of the Nile contains no sewage, but it brings down from the snow-clad tops of the distant mountains the inorganic debris of the soil, crumbled and disintegrated by atmospheric vicissitudes. What a clear and simple proof is this of the great Liebig's mineral theory! for where those frosts and snows prevail neither animals nor vegetation can exist. Mr. William Bullock Webster, who has been travelling in the East, in connection with extensive agricultural objects, has kindly furnished me with much interesting information on Egyptian agriculture.

Inexhaustibility of Land.—The tendency of the human mind to believe in the inexhaustibility of the soil is curiously illustrated by the settlers in the United States. The litter and manure from their animals they get rid of as a nuisance, by throwing it into the nearest river, or any other inexpensive way. A neighbour of mine, whose brother is farming in the United States, told me that he had bought a farm on which there was the accumulated manure of eighteen years! The proprietor had never considered it of any value, because he grew good crops without it. It is this sentiment that has exhausted and ruined much land in the early settlements. The well got dry at last. Let us take warning by this, and not waste either our farm or town sewage.

Effect of Sewage Manure on Woods and Timber.—My own practical experience is, that shrubs and trees increase much more rapidly in growth by sewage than by any other means, and I am quite sure it would pay those who are desirous to grow timber to lay down lines of iron pipes, and effect irrigation with sewage manure. There is no practical difficulty in the matter. Sporting men who love close cover would have it to their heart's content, and the vegetation would be rich in quality and quantity, and so acceptable to game of all kinds, that the adjoining farmers would have much less reason to complain about damage from game than they have at present.

Our noble Parks would be greatly benefited by Sewage. As a general rule (except on particular soils) our parks are poor, mossy, and unsatisfying to deer and other animals; sewage would alter all this, bringing sweet and abundant herbage, promoting and prolonging the growth of our noble timber trees. If you doubt it, examine Lord Essex's park at Watford, where the mere application of sewage has destroyed the drab and coarse ferns, and substituted for them rich, green, soft herbage. The line of demarcation where the sewage has not reached is strikingly illustrative of its great merits. I assume that every gardener knows the value of sewage manure and burned clay.

Effects of Sewage on Wastes and Commons.—There are many extensive filtrative wastes and commons lying within reach of our large towns and cities which would, by the mere application of sewage, become covered with a rich and spontaneous vegetation acceptable and fattening to animals. Non-filtrative wastes would require drainage.

To what Crops can Sewage be most profitably applied.—Cereal crops can rarely be forced beyond a well-known full average—say, wheat 6 qrs., barley 8 to 9 qrs., beans 8 qrs., oats 11 to 13 qrs. per acre; and even to obtain these crops on very richly manured land a very small quantity of seed must be sown, or the crop

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the sewage contains very little, if any, fertilizing quality; certainly none of commercial value. Indeed, a careful consideration of the economy of our rivers might have anticipated the conclusion. Look at the course of the Thames flowing through this great city; consider the enormous population on its banks, before it reaches the metropolis; what would have been its condition had not running waters possessed that quality of self-purification [What does Father Thames say to this during the hot months?], which renders the sewage of towns of no practical value. I trust, then, that this session will not close without our having well considered the conditions under which a well-regulated cesspool system can be properly applied, and under what circumstances towns can be advantageously drained by out-fall sewers."

would fall early and perish, as much has done this luxuriant year; but Italian rye grass, tares, ordinary pastures, cabbage, mangel wurzel, turnips, &c., will bear an immense supply of food (particularly Italian rye grass), and it is especially to these crops that abundant supplies of sewage should be given. We know that the sewage of Edinburgh flows, or is pumped, in even wasteful quantities over the meadows. I have heard of 6,000 tons per acre, or equal to an additional rain-fall of 60 inches. We know that the results are enormous. The annual average letting rental per acre of these (once barren) grass fields is about £20 per acre, some of the older ones letting much above that price. The growth is so rapid during summer that the grass is cut and carried off each fortnight or three weeks. Of course sandy lands would bear very much more fluid than the stiff clays, although the latter are more able to extract and retain the most valuable elements of the sewage. With respect to the London sewage, I should recommend my brother-farmers to have a portion of their farms laid out or piped for irrigation. By very large applications of sewage to this small portion an enormous quantity of green food would be produced, to be carefully cut and carted to the homestead, and fed out with proper admixtures. We should then no longer hear complaints of the farmers' "sore place." I mean that on an average of farms five acres are required to keep each farm horse. One acre as highly fertilized as the Edinburgh meadows would suffice for each horse or bullock, or a proportionate number of sheep. We should then save four seedings, ploughings, labour, rates, taxes, and rents; merely adding the interest for the outlay of piping and payment for the sewage supply. The produce of this portion, when consumed, would furnish manure for other portions of the farm. It is the small acreable returns in farming that cause the expenses to trench so largely on the farmer's profits. I have no doubt that, after a moderate trial of the town sewage, many of us should prefer grazing to corn-growing as a better source of profit. It is particularly suited for dairy produce and the rearing of young stock. It adds very much to the richness and quality of the milk, butter, and cheese; and improves the condition of live stock and poultry. Irrigation gives us very early and late feed. I have found sewage valuable, directly or indirectly, for all crops; and this is not surprising, seeing that it contains the elements of every crop. Of course it would be most available for grass lands, but everybody knows that after land has produced fine abundant grasses for a few years it may be cropped year after year with other and various exhausting crops without manure. There, is probably, no point of more importance in agriculture than that of increasing in quantity and improving in quality the produce of our poor grass and other meat-making soils. In this we are safe from foreign competition, and our rapidly increasing population outstrips our meat-making powers. The constantly increasing price of meat proves this. In what way, then, can we arrive at this result? Experience has profitably taught me that sewage irrigation is by far the most available and effectual improver of our pastures. By irrigation with water alone we not only increase the flesh and fat-producing qualities of our grasses 100 per cent. (see Professor Way's paper, Royal Agricultural Society's *Journal*, vol. xiv. p. 182); but we double the number of grass plants on every square foot of ground. Liebig says, page 276 of his recent work on "Modern Agriculture," "very rich natural meadow contains on one square foot 1,000 plants, irrigated meadow 1,798 plants." Many other instances are quoted by him from "Sinclair on Grasses," showing the same comparative advantage in favour of irrigated grasses. But if irrigation with water only produces such results, how much greater must be the increase when excreta are added to the water! It is to be regretted that Professor Way had not an opportunity of comparing sewage-manure grasses with those of water irrigation.

What is the mere water supply of London worth for irrigating purposes? For ten years all the human excreta of my house, and much of that of my animals, has found its way by irrigation to my land; and it is only those who practise this who can appreciate the progressive advantages of such a practice. It has been invariably applied mixed with much water, without which, in our dry climate, its effects would fail to be so satisfactory. Many farmers have no idea of the value of the river of water (without the manure) daily flowing from the London sewers as a source of farm profit; and I would recommend them to find out and examine the various irrigations with pure water, which are going on in various parts of the country. Considerable sums per acre are expended in putting land into proper form to receive the water. I have noticed this particularly in the neighbourhood of pellucid trout streams in Hampshire. The effect of only a moderate amount of house-sewage or slops is to soften the water, and render even bad bog-water valuable for irrigation.

Why the Sewage Form of Application is the most Profitable.—Baron Liebig, in his last work, page 267, lays down this great principle, that "the action of a manuring agent in a given time must increase in proportion as its surface increases." Now you have, in town sewage, a perfect practical illustration of this principle. The food has been converted into its original elements by mastication and digestion, and it comes to your field dissolved by water, and comminuted or separated by frictional action in the sewers. It sinks into the soil and subsoil in the only condition in which its elements can be seized upon, and condensed on its surface, by each granule of a well-cultivated soil. Compare this with the clumsy dung-heap, where unseparated masses inaccessible to the soil show themselves for years, to the farmer's great loss, thus preventing the quick return so essential to farming profit.

Quantity of Iron Piping required per Acre.—On my farm I find five lengths of 9 feet each sufficient for one acre, say 15 yards of 3-inch iron pipe, weighing about 5½ cwt. per acre. Unless the lines of piping are carefully laid out by some one who understands it, much more piping may be wastefully used Having had experience in this matter, I am willing, on public grounds, to grant permission to examine the process of irrigation on my farm to those interested in this matter.

Soils that would be most benefited by Town Sewage.—Although well-drained clays have the greatest fixing powers, and would pay handsomely for the sewage, still the porous chalks, sands, and gravels would absorb, or rather filtrate, much larger quantities. I believe the Edinburgh meadows, that make so large a return for the sewage, were once sandy wastes.

Sewage Irrigation would necessitate the Drainage and deeper Cultivation of our stiff Clays, 15-16ths of which are still undrained. The mere drainage would largely pay the farmer, after deducting interest on the outlay. Irrigation does not benefit undrained clays. Where large supplies of rich sewage or other manures are applied, it is necessary, by deep cultivation, to mix a portion of the poor subsoil with the upper soil, to prevent the laying of the crops. Shallow ploughing, combined with high manuring and over-seeding, have cost the country more than a million this last fertile season, by laid crops, lean kernels, and diminished produce.

French Use of Sewage.—The sewage question has not escaped the vigilance of our able friends on the other side of the channel. So anxious is the government that it should succeed, that it has granted an annual subsidy of £160 to the Vaujours undertaking. By favour of Monsieur Trehonnais, I have received a long and able report of the system of sewage manuring practised on the farm of Vaujours, about 12 miles from Paris, once forming part of the forest of Bondy. The extent of the farm is about 220 acres, managed by a Joint Stock Company for the express purpose of manuring with the sewage from Paris. The urine or night-soil is brought in a barge, and distributed by portable steam-engine, subterranean pipes (made of iron bitumenized) and jet, at the following cost per cubic metre (about 178 gallons):—

	s.	d.
Purchase, from the authorities of Paris, of a cubic yard of sewage, solid or liquid..............	0	10½d.
Carriage by canal boat......................	0	2½
Taking it from the barge, and distributing it on the land by portable steam-engine of 6-horse power	0	6
	1	7

The contract with the city of Paris was for 11,000 cubic yards of sewage per annum; but experience has shown that this is an over-dose, and that the land cannot bear above half the quantity, or 25 cubic yards per acre. They appear to want our steam-plough, which would give deeper cultivation, and mix the manure with the poor subsoil. The report justly states that steam-power and subterranean pipe distribution were infinitely cheaper than the old plan which they first used, of manual pumping and water-cart distribution. This I can confirm by my own practice, as I could distribute the above quantity of 178 gallons on any part of my farm for one penny. They appear to get their sewage, undiluted, from tanks or cesspools in Paris, and find that its application in dry weather in that state is injurious, that it requires diluting with water, which the canal company will not permit them to abstract from the canal. Applied in wet weather it answers admirably. If a cubic yard of urine and excreta is worth 10½d. in Paris, what should our London sewage produce? I value it at one million annually. It must not be forgotten that in Flanders and Switzerland human excreta is applied, diluted, to the soil by the clumsy and costly process of manual labour. Surely, if, even on these conditions, it answers the purpose where produce is cheap, it cannot fail to pay us here, where mighty steam would reduce the cost of its application to one-fifth, or less. The French report ought to be translated into English, it contains so much valuable information. It is from Monsieur L. Moll, the "Gérant," Monsieur Mille, civil engineer, and Monsieur Vilmorin on behalf of the Council of Management, and extends over 83 pages; it is published by Firmin Didot and Co., booksellers, Paris. Messrs. Mille and Moll had visited our sewage works and irrigated farms in various parts of this kingdom, their remarks on which are embodied in the report. Their report of the Vaujours farm may be summed up as follows:—That the tenants' capital invested is about £6,500, of which £1,800 is for the sewage operation, the remainder for drainage, live stock, implements, buildings, &c. Its returns show a loss of £370, besides interest on capital. That this loss arose from a number of unforeseen circumstances, and from the difficulty of organizing a new system for which there was no exact precedent. One principal cause of loss was the over-luxuriance of some portions of this once poor soil, the manure having been too abundantly applied. Another was the want of sufficient water for dilution. Another the want of experience as to the best rotation of crops, and the most suitable mode of consuming them, or otherwise turning them to account. There were also many engineering difficulties and experiments. The absence of good roads, and the use, in the first instance, of the water-cart and manual labour instead of steam. The rabbits from the adjoining forest did much damage; the labourers were dear and ineffective. There also appear to me to be some defects in the practical farming management; but we know that it takes several years to get into profitable condition a poor neglected farm like this of Vaujours, and the company have only held it two years, the tubular system being completed recently. On the whole, however, a very satisfactory result was ultimately calculated upon, the system of using the sewage having spread rapidly in the neighbourhood. London has an immense advantage over Paris in its powers of economically distributing the sewage, owing to our ample water supply, which does not exist in Paris. Our sewage could by this means be so much more cheaply conveyed and distributed, penetrating deeply into the subsoil. Our coal, iron, and machinery is also greatly in favour of London over Paris, by its cheaper price. In comparison with my own farm, the distributing apparatus has been far more costly. In my own case, engine, tanks, conduits, or iron-pipes, tubing, jet, pumps, &c., complete for working, only cost on 170 acres about £700, or £4 5s. per acre. On the Vaujours farm the cost is set down at £1,800 on 220 acres, or more than £8 per acre. The purchase of a manure barge and the construction of wharfing has added considerably to the cost of the operation. Not having the map of the farm of Vaujours, I cannot know its particular form, but the length of tube per acre appears to be the same as mine. On my farm I have 15 yards of iron subterranean pipe for each acre, the total quantity used on 170 acres being 55 tons, at a cost per ton of £4 18s., including cartage and freight. My iron piping is 3 inches in diameter, and I am told is much stronger than that at Vaujours, which is only of *sheet* iron dipped in bitumen, and will, I fear, soon be destroyed by pressure, or the action of the manure. The French subterranean tubing cost £3 5s. per acre: mine only cost £1 13s. per acre.

Comfort and Profit for the British Farmer.—Hear what Baron Liebig (that profound philosopher) says in the introduction to his first work on modern agriculture; also at page 267 of his recent work on modern farming:—"Perfect agriculture is the true foundation of all trade and industry; it is the foundation of the riches of States. But a rational system of agriculture cannot be formed without the application of scientific principles; for such a system must be based on an exact acquaintance with the means of nutrition of vegetables, and with the influence of soils and actions of manure upon them. This knowledge we must seek from chemistry, which teaches the mode of investigating the composition and of studying the characters of the different substances from which plants derive their nourishment. * * * Whatever practical agriculturists and agricultural societies may do, whatever they may resolve at their annual meetings, every penny spent will be thrown away, and every year of experimenting will be in vain, so long as these practical men will not submit to the teachings of true experience, to the rules of logic or of common sense; from the instant they shall so submit, science will be theirs. There exists a receipt for insuring the fertility of our fields and the permanence of their crops, and which, if properly and consistently applied, will prove more remunerative than all the expedients that have ever been resorted to by agriculturists. It consists in the following rule:—Every farmer who takes a sack of corn, or a cwt. of rape, turnips, potatoes, &c., to the town, ought, like the Chinese coolie, to carry back with him from the town an equal (or, if possible, a larger) quantity of the mineral constituents of the produce sold, and restore them to the field from which they have been taken. He should not despise the peel of a potato, nor a straw, but always bear in mind that that peel may be wanting to form one of his potatoes; that straw to form one of his ears of corn. The cost of carrying these matters to his fields is trifling, and the investment is as safe as a savings' bank, and highly productive withal. The fertile area of his field will, in the course of ten years, be as it were doubled; he will produce more corn, more flesh, and more cheese, without having, on that account, to bestow greater labour and time upon the cultivation of his land; he will be less anxious about his fields, and need no longer keep his mind constantly on the stretch for some new, unknown, and imaginary expedient to preserve their fertility in some other way."

Conclusion.—For many years I have laboured to impress upon the public mind the importance of this great question. Three years ago I had the honour to read to you a paper on this subject; I have now again endeavoured to awaken agriculture from its lethargy and disbelief. I want to convince you that there are cheaper and more available sources of manure than those you now resort to. You are keen enough at a bargain, and rigid economists but this important subject you have evidently not investigated. You don't know, because you have not sought for, the engineering and chemical statistics that would enable you to come to a right conclusion on this subject. Others have done so for you. Avail therefore, of the opportunity which they have presented to you—discuss the question—sift it thoroughly—but do not let it rest until you have come to a satisfactory conclusion. British invention, enterprise, and capital, have done great things for this happy country. Science has opened to us the flood-gates of progress, wealth, and population—welcome her in agriculture—seek her aid—tempt her to your assistance—believe in her powers—and avail of them—and so raise and dignify your calling, that it shall fructify in intelligence and profit, for your own welfare, and for the good and honour of this great nation.

Mr. Sidney (Kensington) having carefully prepared himself for the occasion, he had come forward for the purpose of showing that this sewage question, which had been continually agitated for the last sixteen years, and in the discussion of which he had himself for six years taken part, was one of the greatest delusions that was ever attempted to be thrust down the throat of the British farmer by the combined efforts of official commissioners and amateur agriculturists. He was about to lay before them a collection of facts of undoubted authenticity, which would, he thought, carry conviction to the minds of all present. He had listened with great pleasure to Mr. Mechi's paper; he was sure the Club always listened with pleasure to a speech from the Alderman, however much they might differ from his conclusions; he was always amusing, and often witty and eloquent, so that his talents inspired not less admiration than his many amiable and social qualities; but, at the same time, he must excuse him for saying that he was not an agricultural authority at the Farmers' Club (laughter). He might be an agricultural authority at the Court of Aldermen, or among landlords who knew a great deal more about horseflesh than about farming; but he was not an agricultural authority among rent-paying farmers. On the present occasion their excellent friend rode in on the shoulders of an elephant—Baron Liebig, who had made two very bold assertions: first, that British agriculture was gradually deteriorating—that the system adopted by British farmers was as poisonous as that adopted by the Roman farmers, that they were wasting and wearing out the soil; and secondly, that the agriculture of this country could only be renovated by having recourse to the sewage of towns. Now Baron Liebig was a very great man; but, like many other great men, he had made great mistakes: and he utterly failed when he applied himself to practical agriculture (Hear, hear). Baron Liebig some years ago printed a book which he, no doubt, sincerely wished was buried in oblivion. He happened to have a copy of that book, which proved that the great Professor was not infallible; and as he was mistaken then it was more than probable that he was mistaken now. In 1845 he said (this was one of the greatest mistakes ever made in reference to practical agriculture) that England was being thoroughly ruined by its system of thorough drainage. "During moist and rainy springs and summers, the phosphates and other salts with alkaline bases, also the soluble ammoniacal salts, are entirely or partly removed. *The system of draining which of late has been so extensively followed in England brings the land into the state of a great filter, through which the soluble alkalies are drawn off in consequence of the percolation of the rain*, and it (England) *must become more deficient in its soluble efficacious elements.*" In other words, Baron Liebig asserted that the land must become more and more barren because it was drained. He then went on to say, "I have succeeded in combining the efficacious elements of manure in such a manner that they will not be washed away, and thus their efficacy will be doubled. The injurious consequences of the present system of draining are by this manure removed—agriculture is placed upon certain principles as well arranged as manufactures." What has been the result of the great German chemist's prophecy and promise? Why the draining system he condemned had proved one of the greatest improvements ever introduced into agriculture; and the manure he had recommended had proved utterly worthless. So much by way of reason for doubting the infallibility of Baron Liebig. He (Mr. Sidney) denied that there was any similarity between the Roman system of agriculture, to which in his warning note Baron Liebig called the attention of our farmers, and the system pursued in England. "Roman agriculture was of the simplest description—a crop of grain and a fallow, the arable land being manured once in six years, and in that time bearing three grain crops and one green crop." The result was, that the selling price and rent of land declined—that the price of wheat rose from 3s. 6d. to 10s. in the time of Cato, to 60s. in the time of Pliny. The whole anxiety of the Roman authors was not for progress, but to prevent decline; and between the time of Varro and that of Columella the produce was reduced from 23 bushels to 12; while the price of wheat rose, the price and rent of land declined. "The great distinction," said Gisborne, "between Roman agriculture and ours is this: theirs was precise, correct, regular, persevering, careful, but altogether unelastic. Ours is coarse, without system, inaccurate, often wasteful, but full of resource. They saw their produce dwindle, and their country become more and more dependent on importation for daily bread, with every temptation in prices, but found no remedy." In his (Mr. Sidney's) opinion, this talking about the decline of the fertility of the British soil, when they knew very well that the farms which had been best and longest cultivated were also the most fertile, was a mere piece of clap-trap used in order to excite attention to the fallacies about to follow. He would now turn to another piece of clap-trap—the reference to China for a lesson. Did those who recommended China as an example know what sort of country it really was? It was a country where at the corner of every street and of every dozen houses and by the road-side, in all directions, there was a privy. Everybody who passed was expected to resort to this privy, and as the population of China was very dense, and labourers could be had in abundance for twopence a-day, the manure was carried away in a solid, not in a liquid state, and the results under a Chinese sun were highly satisfactory. Now, he asked whether the feelings and habits or the wages of the people of this country would permit the adoption of such a system as that? If not, all that was said about the matter was mere rhetoric. Moreover, they could not bring the climate of China to this country any more than they could bring the climate of Egypt, Lombardy, and other irrigating countries which were constantly quoted as examples for them to follow. He perfectly agreed with Mr. Mechi, that if the sewage of large towns was to be used at all, it could only be had in a liquid form. The people were not prepared to give up their water supply in order to save a manure which was not even saleable in London. He agreed with him that in small towns and in villages a great mistake had been made in adopting an elaborate system of sewage, that it would have been much better to have adhered to a rational system of cesspools and had the manure carried to the land in a solid form; but he also concurred in his opinion that in the case of great towns, and particularly in that of London, if they wished to turn the sewage to account, they could only do so by using it as liquid manure. And the question turned, not whether liquid manure was fertilizing, but whether it would pay for machinery and pumping. With respect to the advantage of using liquid manure, the question was by no means a new one. He remembered that when it was introduced in that club about six years ago, he said what he now repeated, that he was quite tired of hearing of experiments in a wine-glass, and of crops which might be carried away in a wheelbarrow, and he was sure the members of the Club generally must be also weary of such old stories as those of the Edinburgh and Mansfield sewage meadows, or of Mr. Chadwick's extraordinary crop of cabbages with liquid manure mixed in a hogshead (Laughter). The idea of sewage manure cultivation was first introduced to the British public in 1844, when Mr. Smith, of Deanston, published his description of the Edinburgh water meadows. The old town of Edinburgh stood on a hill: there were some two hundred acres of sandy land below: the sewage was directed to that land, and the result was that very extraordinary crops were grown at the cost of a most extraordinary nuisance. The nuisance, indeed, was so very great that, keen as the Scotch were in money matters, the townspeople of Edinburgh had not thought proper to have the cultivation extended beyond two hundred acres. Scotchmen were not people who were in the habit of throwing away a shilling, and they might depend upon it there were very good reasons why the area of cultivation had not been extended.

A Member observed that the area cultivated was 400 acres, and that all the sewage available was used.

Mr. SIDNEY had been otherwise informed. The statement of what had been done in the vicinity of Edinburgh produced such a powerful effect on the minds of the Commissioners of Metropolitan Sewers, that they inserted an advertisement in the newspapers inviting all the farmers within fifty miles of London to send in tenders for the sewage. In 1848, their excellent friend, Mr. Cuthbert Johnson, called the attention of British farmers to this subject, and urged upon them not to allow such a chance to be lost; and he had reiterated his views in nearly the same words in 1860. The Commissioners employed Mr. Austen to assist them in carrying out their scheme. That gentleman sketched out a very pretty plan by which the sewage was to be pumped out for the farmers and market gardeners round London. The only difficulty in the case was that the farmers would not buy the manure (laughter), and in 1856 Mr. Austen came to the conclusion that was arrived at by other eminent engineers, namely, that the carrying out of his plan would involve great cost without any profitable returns. In 1851, Mr. Superintendent Lee was sent to report on the liquid manure farms of England in work and about to be worked. He found Mr. Littledale, a wealthy Liverpool merchant, Mr. Nielson, a Liverpool broker, the Duke of Sutherland, and other wealthy amateurs, working, or about to work, pumping apparatus, pipes, and hose. He wrote a sort of prophetic report, promising extraordinary profits, and ended by recommending Mr. Robert Smith, of Exmoor, to substitute a steam engine, underground pipes, and hose for his catch meadows. This report, although some of the farms have been abandoned, and none have realised a profit, has been quoted as a standard authority by the liquid theorists from that day to the present. In 1853, Mr. Mechi read before the Society of Arts a paper on his own agricultural practice at Tiptree Farm. On that occasion he said:—"The difficulties are insignificant: they exist in the brain, not in the fact. But you must work a change in the minds of the agriculturists, or they will hardly take as a gift, much less pay for liquid sewage." And Mr. Mechi was consistent: he was saying the same thing in 1857. All he would say in reference to this, was, that agriculturists with very little science showed a good deal more sense than some people with very great scientific pretensions (laughter). In 1854, Mr. Mechi read another paper before the Society of Arts. He (Mr. Sidney) took the liberty of saying a few words in reply to the paper, which, he might remark, was as ingenious and eloquent as that to which they had just listened; though, there being less experience to draw upon, the writer had more scope for his imagination (laughter.) He would appeal to them whether the following was not a correct account of the solid and liquid manure theory:—"As to liquid manure, there were no doubt circumstances under which it might be used with advantage for green crops, but the balance of evidence was against its exclusive use for every kind of crop. The use of solid manure was mechanical as well as chemical. When once laid in the soil the labour was done: it gradually and surely gave forth its fertility. Liquid manure was not economical, sometimes injurious to root crops, and to corn crops positively injurious—stimulating the straw at the expense of the ear, and pushing away the soil from the roots. Applied to grass at proper times, especially Italian rye-grass, and in proper quantities, the results are very satisfactory. But young farmers must pause before they altered the whole economy of their farms, and went to great expenses in iron pipes, hose, pumping, and building tanks for a manure so difficult to manage, and available for only one kind of crop." Thus they would see that they were not then in a state of experiment, but had had years of experience, and he had watched the thing very closely throughout. In 1855 Mr. Mechi read a paper before the Farmers' Club, on town sewage, and was supported by Mr. Chadwick. In 1855 Mr. Chalmers Morton, of the *Agricultural Gazette*, read an able paper (his papers were always able) in which he gave an account of the liquid-manure farms of the north of Scotland. These were what might be termed the stronghold of the liquid manure theorists. They were always telling them about what Mr. Telfer and Mr. Kennedy had done. Now here he must say that, while on the one hand credit was due to Mr. Mechi for urging on landlords the necessity of agricultural improvements, he ought not, in speaking of Mr. Telfer and Mr. Kennedy's farms, to have concealed the fact that the system adopted by them had been a failure (Hear, hear, and No, no). He would place before them a statement of the condition of those farms in 1860; and when he had done so, they would be astonished at Mr. Mechi having been referred to them as affording proofs of the value of liquid manure. Mr. Morton, in 1855, said, "I have never been on a farm where such a detailed record of every operation and its result is kept, as is kept at Cunning Park." "Twenty-five acres, under irrigation, wholly kept forty-eight cattle." "During two years, an acre will have yielded between 80 and 100 tons green food, in seven cuttings, by the use of a ton of artificial manure, and 700 tons of dilute liquid." "Mr. Telfer sends his butter up 400 miles, to Jermyn-street. It fetches as high a price as any in the market; and I believe that, notwithstanding the expense of carriage, and the high pressure under which it is made, it reaches Jermyn-street with as large a balance of profit per lb. to the maker as any that is sold." "And I quite expect, as the result of this day's meeting, to find that Mr. Telfer's practice is being copied in the neighbourhood of London." Now, if it had been a fact that 25 acres of land supported 48 cattle, and that butter was sold at a profit, at a distance of 400 miles, the result must indeed have been satisfactory; but he felt quite certain that Mr. Morton had been deceived. It might be remembered by some that there was a very hot discussion in 1855 in reference to the hay crops of these farms. The farmers of England were continually worried by being asked by landlords and others why they did not imitate the Scotch liquid manure farmers, and told that they must be a slow set of fellows (laughter). He would prove, before he had done, that the slowness was on the other side. In the same year, in 1855, Mr. J. B. Lawes read a paper before the Society of Arts on the sewage of lands; and in that admirable production he stated distinctly that sewage manure was of no value whatever except for green crops. Mr. Lawes analyzed the matter very closely, dispelled a great many absurd exaggerations with respect to it, and recommended that any experiments which might be made should be made very carefully indeed. On that occasion, having recently visited some liquid-manure farms, and endeavoured to make himself master of the subject, he (Mr. Sidney) took some part in the discussion, pointed out the enormous exaggerations which had prevailed, and remarked that the country had for some time been too much under the influence of the Board of Health as regarded the value of sewage. His observations gave great offence to Mr. Chadwick, who said "there was no foundation for the assertion that liquid manure was not applicable to all kinds of crops, and ventured to declare that it was exceedingly beneficial to cereal crops." Knowing that the corn crops were the most important in the estimation of British agriculturists, he endeavoured to persuade them that liquid manure was as beneficial to cereal as to green crops. The discussion, however, did not end there. In December, 1856, Mr. Fothergill Cook read before the Society of Arts a paper, in which he tried to make out that something could be made out of solid manure deodorized—an idea which had long since been rejected. On that occasion Mr. Chadwick again expressed his views; and he (Mr. Sidney) entered into the whole history of the matter, and directed special attention to the case of the Rugby Farm, "Where, on 200 acres of wonderfully porous soil, a good effect had been produced on grass." And this was the only practical instance; although, in 1853, Mr. Chadwick had written to the Home Secretary, stating that ten towns were about to use sewage irrigation; and that in 1856 a paper, read under Mr. Chadwick's auspices at the Free Trade Congress at Brussels, insinuated that a hundred towns in England were about to derive revenue from sewage irrigation, and Mr. Mechi and Mr. Walker, the attorney of Rugby, were held out as the leaders of agricultural progress in England! In 1857, Mr. Chadwick wrote a letter to the "Journal" of the Society of Arts, containing a statement, which, if true, would have made the fortunes of all who used sewage manure, namely—"*Three years increasing corn crops by the use of sewage alone; last year* at the rate of 50 bushels an acre at Rugby." "*At Mr. Mechi's, and the new liquified manure farms in England, the yield has been almost invariably one quarter heavier than the highest obtained by the ordinary culture!*" Having read that, he put himself in a railway train and made a second visit to Mr. Berry Congreve, the occupier of the farm referred to (the brother of the Mr. Congreve who was present in the room). That gentleman told him that he had never had more than ten acres of wheat under the system at all; that the application of sewage manure was a mere experiment, and had been a total failure, the result being less every year.

Mr. Alderman **Mechi** said Mr. Sidney had not told them what the produce was.

Mr. **Sidney** said he forgot what it was; it was, however, ridiculously small. On his return he embodied the result of his enquiries in a letter to the "Journal" of the Society of Arts. In this letter, after giving the result of his enquiries at Rugby, which completely contradicted Mr. Chadwick, he said: "Mr. Mechi's crop was not grown with weak sewage liquid, or even with the contents of his liquid manure tanks, but with a liberal application of guano and salt. He grew bad crops with mere liquid; but having imitated Mr. Fisher Hobbs, Mr. Hutley, and Mr. Hudson, he grew fair crops." To this letter Mr. Chadwick and Mr. Mechi both replied. The first flew off to the south of France and Africa, and the Alderman accused him (Mr. Sidney) of mis-stating "facts;" and ended with—"In spite of the Sidneys of other days, gas, steam, the electric telegraph, and other once-called impossibilities, have resolved themselves into acknowledged truths." To this letter, which was a mere evasion of the point at issue, he (Mr. Sidney) replied by a statement which contained this paragraph:—"In a debate at our Farmer's Club, April, 1856, Mr. Nesbit, the agricultural chemist, said—'I recollect some years ago being down at Mr. Hutley's farm, in Essex, and perceiving that, without science, Mr. Hutley completely thrashed my friend Mechi, with science.' Mr. Hutley applied 15 or 20 loads per acre of farmyard dung in the autumn, and ploughed the land five or six times. In the spring, before sowing, he applied 3 cwt. of guano, 4 cwt. of salt, and some rapecake, and drilled the mangel seed with a little superphosphate. The result was 40 tons per acre on Mr. Hutley's farm, whereas Mr. Mechi averaged only about 13 tons. Mr. Mechi has since improved." Mr. Mechi followed, with his usual good humour, never mentioned liquid manure, but said—"He concurred with Mr. Nesbit. His largest crop, 43½ tons to the acre, had been grown by 20 to 30 loads of farmyard manure, 5 cwt. of guano, and 2 cwt. of salt to the acre; manuring the surface, then double trenching, and again manuring the deep furrows. Such treatment paid in the growing crop, and greatly increased the after crop." He (Mr. Sidney) thought that they would all agree with him that that was pretty good farming, and that after Mr. Mechi had put on his land loads of farm-yard manure, guano and superphosphate in such abundance, it was not quite fair to write and talk as if it was liquid manure that grew such large crops (Hear, bear.) In August, 1857, a French gentleman, who was, he believed, well known to many persons in that room, he meant Mons. Barral, editor of the *Journal d'Agriculture Pratique*, one of the most able and conscientious men he had ever met with, came to this country for the purpose of examining this liquid manure system, and having visited various farms, including that at Rugby, and those in Scotland, the result was that he made a most unfavourable report. For this he was attacked in the Journal of the Society of Arts, in very strong terms, by Mr. Chadwick, who seemed to ignore the fact that besides being a distinguished chemist, Mons. Barral was the editor of the leading agricultural journal in France, or on the Continent. Mr. Chadwick said, that what Mons. Barral stated respecting the farm at Myremill was devoid of truth, and insinuated that that gentleman and himself (Mr. Sidney) were retained by interests hostile to those who were engaged in the cause of science and health. He would not trouble them with his own answer to that letter, because facts had subsequently established the truth of what was questioned at the time. Mons. Barral was followed in his investigations by Mons. Risler, a gentleman from Switzerland, where liquid manure was very much used; and this distinguished writer, in a letter to the *Journal d'Agriculture Pratique*, said: "None but amateurs had yet adopted the liquid manure system alone. Noblemen and gentlemen with plenty of money to spare had tried it by itself; but Mr. Mechi, influenced perhaps by the example of the practical farmers with whom he associated, had taken care to apply plenty of solid manure, and plenty of phosphate and guano." "It will never extend in England or Scotland, because those are wheat-growing countries," continued Mons. Risler, "and where they grow wheat they will use the straw." That was the opinion, be it observed, of a gentleman from Switzerland, where liquid manure was exclusively used. After repeating a joke against Mr. Mechi, he said: "No serious example can be quoted of turning all the manure into liquid. Mr. Mechi had told them with commendable candour that the farm at Vaujours, near Paris, started by a joint stock company, under the auspices of Mr. Chadwick, assisted by a grant from the French Government, and aided by the advice of eminent agricultural chemists, had proved a failure. He attributed the failure, indeed, to the rabbits; but never had money been lost through the adoption of a crotchet without some extraneous reason being alleged to account for the failure (Hear, hear). These were the results of past experience; he (Mr. Sidney) would be very glad if the future produced something better. He had brought them down to 1857-8, but he would not limit his retrospect to that period. As they had heard from Mr. Mechi how Mr. Telfer, with liquid manure, produced 40 tons an acre in Scotland, in 1855, and how much it would produce under the same system near London, he would show what was the condition of the Scotch farms in 1860. If liquid manure did not answer on those farms, where persons washed in guano and gas water, how could it answer to sink a couple of millions in conveying such manure to the farms near London? Myremill farm, with 300 acres, (furnished with pumps and pipes) was washed for six years, viz., 1850 to 1856, for the proprietor, Mr. Primrose William Kennedy, banker, of Ayr, by his agent, Mr. James Kennedy. In 1856, Mr. James Kennedy left, and went to a farm in England. During that period of six years the sum sunk on Myremill farm, as proved in the accounts of the Western Bank of Scotland, when it was wound up, was £33,000.

A **Member**: What is the number of acres?

Mr. **Sidney**: 300 freehold; about 300 more held on a lease. Competent authorities estimate that after making a liberal allowance for buildings and improvements, the positive loss on this liquid manure farm, of 300 acres, had not been less than 18,000*l.*, being an average of 3,000*l.* a-year (Hear, hear). That was the farm which had been referred to at Paris, Brussels, at the Society of Arts, the Farmers' Club, and every place where Mr. Chadwick or Mr. Mechi had opened his mouth on the subject of sewage, as presenting an example for British farmers to follow.

Mr. **Mechi**: Do you know that it is let at a greatly increesed rental?

Mr. **Sidney** said it was let at that moment for 800*l.* a-year—it had never been let at any rent before—a very poor return for an expenditure of about 50,000*l.* (Hear, hear). After being managed for a short time for the landlord by a Mr. Smith, Myremill was let on lease, in 1857, to Mr. Duncan, by whom the use of this costly irrigating apparatus is confined to the washing-in of artificial manures into the roots of a few acres of Italian rye grass. Such was the present condition of the celebrated Myremill farm. Mr. James Kennedy having lost Myremill farm, came to England, and he believed he had done worse here than in Scotland.

Mr. Mechi: He had no irrigation.

Mr. Sidney continued: Mr. Mechi seemed to know more about the matter than he did, which made his silence about Myremill failure more odd. Cunning Park, another of the famous liquid manure farms, described by Mr. Morton in glowing terms, has utterly ruined the owner, Mr. Telfer, although admirably managed, as far as quality of dairy produce went. Mr. Telfer had a good business as a merchant: he has failed paid an extremely small dividend, and the farm has, of course, been sold. For two years before the bankruptcy, and consequent sale of Cunning Park, the principal part of the farm was devoted to growing early potatoes for the Glasgow market; of course without the use of liquid manure. Now, he thought they would all agree with him that he had proved all that he undertook to prove at the outset (Hear, hear.) He had shown that after sixteen years of official exhortation and amateur farming, no pumping liquid-manure farm had paid a profit, and no practical farmer had followed the path which Mr. Mechi praised, but did not follow. He would conclude by reading a very important document bearing on this question. It was a letter from Mr. Thomes Hawksley, who held a first-rate position as a practical and scientific hydraulic engineer. That gentleman had paid great attention to this subject.

Mr. Mechi: You have heard, gentlemen, what Mr. Hawksley says previously; I brought it before you.

Mr. Sidney continued: Mr. Hawksley had written to him as follows:—

"1. The dry weather sewage amounts to about 400,000 tons weight per diem, equal to the cargoes of a fleet of 400 ships, each of 1,000 tons burthen.

"2. Except to a small extent, it could not be applied in the neighbourhood of London without pumping power, and then on moderate computation would require an average exertion of 3,000 horse-power kept at work night and day.

"3. The expenses of the construction and management of such a pumping apparatus would be enormous, utterly disproportionate to the result to be obtained.

"4. For although a vast quantity of very valuable fertilizing matter enters the sewers, it suffers oxidation so rapidly when agitated, in contact with air and water, that it almost ceases to be *an ammonia-producing agent*, and on quitting the sewers is all but worthless as an agricultural stimulant. Its value as a mere irrigant being slightly greater than that of ordinary water; not sufficient to enable it to bear carriage to a considerable distance '*uphill and down dale*.' Six or seven hundred tons of water must be conveyed as the vehicle to place a single ton of solid manure on the land.

"5. When laid on land in large quantities, liquid sewage stinks horribly; in moderate quantities, it requires so vast an area for its distribution as to render its application impossible.

"6. Except under very favourable and extremely exceptional circumstances (Edinburgh on a hill. S.S.), the liquid sewage is of no worth, and the solid matter obtained by any known deodorizing process has always remained a drug on the hands of the heedless manufacturers.

"7. *The valuable properties of the native material are for the most part destroyed by chemical changes in the sewers;* hence it becomes just possible to transmute lead into silver, ashes into coal, as to profitably employ the sewage of a great city in lieu of farm manure. When you can at a profit recover the smoke of a rifle into the original gunpowder, you may reasonably expect to displace guano and homestead manure by liquid sewage!"

Mr. Sidney concluded by claiming some credit for having accurately described and recorded "The Progress of English Agriculture;" and urging that he was entitled to not less credit for opposing and exposing dangerous and costly fallacies, than those who pointed the way to substantial improvements (cheers).

Mr. Williams (Baydon, Hungerford) despaired of sewage manure ever reaching him, on account of the elevation and the distance of his farm from any town of considerable population; and he almost felt envious of those farmers who resided in the neighbourhood of the outfall of the Thames, notwithstanding the assertions of some scientific men that sewage manure was valueless. As a practical farmer himself, however, he hoped to see vast results accrue from its application. When he heard that the Thames, especially in the summer season, was almost turned into a solid instead of a fluid by the quantity of refuse that was discharged into it, and that in the course of last year a sailor who fell into the London Docks, being only immersed three minutes, was found by a coroner's jury to have been suffocated, not drowned, by the foul state of the water, he could not help thinking that there were elements in that water, which, carried on to the land, must be beneficial to agriculture. He could not hide the fact from himself that in Hampshire, where there were some of the best water meadows in the kingdom, in his own and other counties in the west and south-west of England, they turned out every drop of water that they could from the rivers for the purpose of irrigating the lands in the neighbourhood, by which means they increased the produce threefold; and seeing the quantity of soil that was contained in town sewage, it was of the greatest importance that the subject should be considered and discussed. He was grateful, therefore, to Mr. Mechi for having so ably introduced it to the notice of the Club. In his own and adjoining counties many persons would gladly increase the extent of their water-meadows; but the instant that they set about it, the millers from below came upon them and threatened them with an action, if they turned the water over any other meadows than those where custom had given them a right to do so. In his own parish there was but one well, and that 300 feet deep; yet at that elevation he contrived to have a catch meadow. The manner in which he contrived it was this: In very wet weather he brought the runnings of a road, and what came off his neighbour's farm, through his yard, the drainage of which it received, and it then passed on to his meadow. The result was an increased produce of 50 per cent. wherever he turned the little stream; for it was very small, being less in volume than would pass through a hat.

Mr. James Thomas: The observations of Mr. Williams seem rather to apply to the utility of water-meadows than to the sewage of towns (Hear, hear).

Mr. Williams: What he had said would apply equally to the water of the Thames. When the sewage of London had been taken two or three miles down the side of the river, the question would be what should next be done with it; and he believed that the solid matter might be separated from the fluid, and the latter diverted over the meadows in the vicinity to the extent of many thousand acres, being lifted to the highest level, and then watering them by gravitation on the principle of a catch-meadow; whilst the solid portions might form the raw material of a vast amount of artificial manure, for the benefit of farmers who could not apply the sewage. He repeated, therefore, that he was envious of the farmers who lived near the proposed outfall.

Mr. Edmunds (of Rugby) wished to state to the Club the results of the application of sewage to the land in his neighbourhood. There was much that was deserving of consideration in what both Mr. Mechi and Mr. Sydney had said, but one fact was worth a whole bundle of theories. The question was, what was to become of the sewage of towns? They objected to poison the rivers with it. Could they not, therefore, make it effective and valuable for the purposes of agriculture? As yet, it was not so, and facts proved it. What Mr. Sidney said was partly true: it was not effective, except for grass crops; but that it grew enormous crops of Italian rye, and other grasses, Mr. Campbell's and Mr. Walker's experiments sufficiently proved. On the other hand, it was very questionable whether it had done good to either roots or cereals (Hear, hear). No doubt the land was being deprived of a vast quantity of manure by the general adoption of water-closets. A material, which was the most valuable thing they could apply—indeed, he questioned if it were not quite as good as guano (Hear, hear)—was being thrown away; but the experience of Rugby was this. There they had a town of eight thousand inhabitants. The quantity of water for sewage purposes alone amounts to 250,000 gallons; and when this enormous body of water was increased by the rainfall, the land became saturated with moisture like a bog; and the difficulty was this—that they got immense quantities of water in the winter, when they did not want it, but a short supply in the summer, when they did. Now, in Leicester they had endeavoured to precipitate the solid portion of the sewage, but it had turned out to be utterly worthless, the valuable portion of the manure being carried off in a fluid state in the water. He thought, also, that however useful town sewage might be, the cost of transporting it to any distance into the country would neutralize its value. He considered that its value depended very much upon the situation of the town itself. If it stood upon a hill, for example, and the sewage could run over the meadows, with little expense for pumping, in the state in which it went from the works, it must be of a certain value there could be no doubt of it. The sewage of towns contained the elements of all the best manures that were known; but when diluted with a vast quantity of water, the difficulty was what then should they do with it? He would conclude with observing that the man who could discover the means of precipitating into a solid that valuable portion of excreta which the water now appropriated and carried away, would do more for British agriculture, and for the purification of our large rivers, than anyone who had yet existed.

Mr. CUTHBERT JOHNSON (Croydon) recalled the attention of the Club to the real subject of discussion, namely, the use and value of Sewage to Agriculture. Speaking in the name of the farmers of England, he must complain that the discussion had not taken that turn. Even Mr. Mechi, who introduced the subject, had allowed himself to deviate rather widely from the mark, and had travelled over a number of farms upon which sewage was not employed, whilst Mr. Sidney had wandered to every point of the compass, and dragged before their notice a variety of bygone speeches and exploded doctrines which had nothing whatever to do with the matter (Hear, hear). Now the question which, as practical men, bearing in mind the L. S. D. part of the story, they had to decide was this. There were in this country at the present moment two considerable towns where the use of sewage was notoriously successful. One of these was Mansfield, in Nottinghamshire. His Grace the Duke of Portland had 400 acres of meadow land there, which was irrigated with the sewage of Mansfield, and so far from being afraid of its being diluted with water, he had taken the whole of the little river Maun, which flowed past the town of Mansfield, and, mixing it with the sewage of that place, had irrigated these 400 acres. What was the result? Go to Mansfield, and ask any of the practical farmers about there, who knew nothing of the doctrines which were promulgated by Mr. Mechi, and still less of what Mr. Sidney had said, and they would tell you "there are 400 acres of land, the richest and most productive in all Nottinghamshire: the grass it produces far outdoes anything we have ever seen in our experience;" and the Duke of Portland would tell you that the last tenant of the land, before it was converted into water meadows, refused to pay an additional 3s. an acre for the renewal of his lease. [A voice: That was forty years ago.] Yes; it was a good many years ago.

Mr. MECHI: Did it not cost the Duke of Portland £150 an acre to arrest the sewage?

Mr. C. JOHNSON could not say; but it was something considerable.

Mr. MECHI: And he now lets it at £10 an acre.

A MEMBER: What is the increase of produce since the application of the system?

Mr. C. JOHNSON had put the question to his Grace; and the reply was that he did not let it, but held it in his hands; but that it was the most productive 400 acres in all Nottinghamshire.

A MEMBER: So it was 40 years ago.

Mr. C. JOHNSON: Well, let them go a little farther north. In the case of Edinburgh, they had 300 or 400 acres irrigated with town sewage, and within the last four or five years, so satisfied were Scotchmen of the value of this manure, that after employing it in the irrigation of these lands, and it had fallen by its own gravity to a lower level, they had erected steam-engines for pumping it again to lands of a higher elevation. He implored the English farmers, then, not to be led away by any arguments which might have been put forward that night. Let them ask themselves whether, in the case for instance of the immense mass of liquid manure that was hourly pouring into the Thames, it was not possible to avail themselves of its use in some practical way. Mr. Mechi had made some remarks upon the apathy and negligence of the farmer with regard to liquid manure. Now, upon that point he begged to differ from Mr. Mechi. The fact was that the farmer had not the power of getting at liquid manure (Hear, hear.) And the question was, how he might get at it; whether, now that all the manure of London was to be conveyed four or five miles out of town, something might not be made of it; and could it be made to answer in a pecuniary point of view? When all this liquid manure had reached the mouth of the sewer at the level of Trinity high-water mark, where it was of no use to the farmer, so far as irrigating land by its own gravity was concerned, could it be raised by means of the pump at such a price as to make it worthy of his notice? Anxious to obtain information upon this point, he had addressed some inquiries to the great manufacturers of Cornish engines at Hayle, in Cornwall, Messrs. Sandys and Vivian, and he now held in his hand their reply, dated the first of this month, in which they stated: "That the best Cornish steam-engines employed for raising water from their mines, by the consumption of 112lbs of Welsh coal, raise—

3,680	Tons of water	10	feet.
1,840	,, ,,	20	,,
1,226	,, ,,	30	,,
930	,, ,,	40	,,
736	,, ,,	50	,,
613	,, ,,	60	,,

So that this was equal to 50 tons raised 60 feet high for one penny." Supposing therefore that 500 tons of sewage were needed for each application of the sewage to an acre of grass, and that this had to be raised 60 feet, the cost for fuel to raise this great bulk by a Cornish engine would be ten pence. If it had to be raised only 30 feet, the cost would be five-pence. But if raised 60 feet, and as at Edinburgh, the watering repeated eighteen times a year, all this would involve a yearly cost for coals of only fifteen shillings. The question lay in a nutshell; and if, as these Cornish gentlemen said, 500 tons of liquid manure could be raised 60 feet for the sum of tenpence; if by repeating this process eighteen times a year, the irrigated meads of Scotland could be let at an average of £20 an acre; and if for 15s. expended in coals similar results could be produced here, then he entreated the Club to consider whether the question was not deserving of serious consideration, and the system itself of their warmest encouragement. Mr. Cuthbert Johnson was subsequently asked in what space of time 500 tons of liquid manure could be raised 60 feet? Mr. Johnson was unable at the moment to give a satisfactory answer; but he now adds that the fact that the coal consumed in the operation would not cost more than 10d., must convey the idea of great rapidity. The volumes of water many Cornish engines pump up is astonishing; and although not in a position to state the exact figures, the process of raising 500 tons 60 feet by the consumption of a bushel of coals can be very rapidly accomplished. "Leam's Engine Reporter" for November, 1856, states "that the average duty of 22 steam-engines, total 1,140 horse power, with a consumption of only 1,413 tons of coals, has raised the enormous quantity of 11,000,000 tons of water 20 yards high in one month." The time required, in fact, depends upon the horse-power of the steam-engine. A Cornish engine of forty-eight-horse power would raise the amount 60 feet in less than an hour. There are two engines of sixty and eighty-horse power at work at Spodes Hole, near Spalding, which raise *per minute* 300 tons of water seven or eight feet high (see *Journal* Royal Agricultural Society, vol. viii. p. 118).

Mr. J. PARKINSON, Jun. (Notts): Reference having been made by Mr. Mechi to the value of water after it had passed through the state of sewage, and by the last speaker to the water-meadows of Clipstone Park particularly, he was anxious to say a few words upon the subject. These water-meadows were originally set out and designed by his (Mr. Parkinson's) father, who first suggested the idea to his Grace the Duke of Portland. Mansfield was not the populous and the important town it was at present, and the idea was that the water alone was to effect the benefit. Subsequently, however, the town grew in population and size, and the sewage becoming of much greater value, had produced all the more benefit to the land. After the Duke of Portland had made his extensive water-meadows, and they had been carried on some years, Lord Manvers proposed to adopt the same system further down the river, and thus taking the water after the Duke had done with it. The remark which his Grace made was this: "Lord Manvers is quite welcome to my small beer;" but the fact remained that Lord Manvers' meadows were quite as good as the Duke of Portland's—showing, therefore, that it was not the sewage alone that did the good, but that the oxygen in the water was as useful as the sewage, in that case at any rate.

Mr. James Thomas (late of Lidlington): If he could collect anything from the speech of Mr. Cuthbert Johnson, it was that that gentleman seemed anxious that the Club should assent to the idea that the sewage of large towns conveyed by its own gravity over grass meadows would be useful and valuable. If that were the only conclusion which they were to arrive at, it need hardly have taken Mr. Mechi an hour and a-half to convince them of it, because they all knew how diligent and careful the farmers were, in every parish in every county, to convey water where opportunity served to the tops of the meadows so as to irrigate them at pleasure; and no one could doubt that water, so useful in that form, would be none the worse for being mixed with the sewage of towns. However, it was very little better for the admixture, inasmuch as the sewage-water, after having been used by the Duke of Portland for his water-meadows, was found to be equally serviceable by Lord Manvers. Taking, in connection with this fact, the letter of Mr. Hawksley, which had been read by Mr. Sidney, he could come to no other conclusion than that where town sewage could be applied in the same way that water was applied to meadows, it ought not to be wasted; but that were a large expense to be incurred in the process of pumping, the system must turn out a complete failure.

Mr. T. Congreve (Leamington, Hastings) had seen his brother on Friday last, and informed him of the subject for discussion this evening. His brother expressed his desire to be present, and his regret at not being able to attend; but he had requested him to say, with perfect truth, that if Rugby town would give him the sewage, and it would descend by its own gravity over his farm, he would accept it; but that if it was to be first mixed with a large quantity of water, collected in tanks, and then to be pumped up and distributed over the land through pipes, it would be valueless. "In fact," he continued, "I am losing a considerable sum by the sewage of Rugby every year" (Hear, hear).

Mr. Copeland (Camden Town) said there was a parish in Essex, on the banks of the Thames, in which there was a farm that was formed entirely of the sediment of the river and was overflown every year. Some years ago he met with a surveyor who was engaged in valuing the tithe upon that farm, and who told him that he valued it at 39s. 6d. the acre; that he considered it to be worth more than that, but he had long made up his mind never to value any tithe at 40s. (a laugh); that as he rode through the farm on his cob, he could see nothing but the sky above and the wheat on all sides of him; and that piece of land had never been cropped with anything but wheat for a great number of years. That statement, he need scarcely say, made a deep impression upon his mind with regard to the value of sewage manure.

Mr Nockolds (Stanstead, Essex) believed that if town sewage could be supplied to the farmer in a convenient form at a distance from town (the farmers immediately around the metropolis being well supplied with stable dung, and other solid manure), it would be readily purchased by him if it were found to pay. That was the whole question. The farmer paid immense sums for guano, cake, and other manures, and he would be quite as ready to buy the sewage of the towns, if it could be produced at a remunerative price.

The Chairman was of opinion that a certain value must attach to town sewage in the production of green crops; but one thing which had escaped notice in the present discussion was its effects upon the health of a neighbourhood. They might increase their produce, but might they not do it at a risk of pestilence (Hear hear)? He regretted to say that he could speak feelingly upon the subject, and had this year suffered in his family and in his cattle entirely in consequence of the outscourings and filth of the camp at Aldershott being laid on a farm adjoining to his own. In one instance the manure was placed within 20 or 30 yards of his milkman's bedroom window, one of whose children sickened of the scarlet fever, which was soon after brought into his (Mr. Coussmaker's) own house. Upon the pastures in that part of the farm, he could not venture to walk, the stench was so overpowering; his cattle were attacked with pleuro-pneumonia, and out of a herd of 56 he had only 18 remaining.

Mr. Mechi: Was the manure in a liquid or solid shape?

The Chairman: Exactly as it came from the camp. There used to be a manufactory in the neighbourhood, where it was deodorized; but it proved such a nuisance, that it had to be done away with, and the camp was glad to get rid of the manure at any price. When the manufactory was in operation, he had tried some of the manure in a deodorized state for turnips and mangold wurtzel against guano, which being double the price, he only used half the quantity, viz., 4 tons of Aldershot, against 2 tons of guano; the guano beat it in every instance.

Mr. Mechi, in reply, said they were all agreed, except in one instance, that either water alone, or sewage, applied to grasses would produce an abundant crop. That being so, they need not concern themselves about the question of corn; for a good crop of corn, beans, or anything else could always be grown upon a good piece of grass land after it had been broken up. He begged them to receive with considerable caution the statements which had been made by Mr. Sidney. To suppose that water would injure manure was absurd, the fact being that without water manure was worthless. The rainfall was 24 inches per acre, or 2,400 tons every year, and this fell upon all their crops, and if it did not, he very much feared that they would have little chance of a harvest (Hear, hear.) The question of the proportion of water to the sewage was dependent upon various circumstances; but plenty of water they must have if they would have a harvest in this country.

Thanks to Mr. Mechi for his paper, and to Mr. Coussmaker for presiding, terminated the proceedings.

A meeting of the Committee was held at the Club House, New Bridge-street, Blackfriars, on Monday, February 6—L. A. Coussmaker, Esq., in the chair. There were also present, Messrs. R. Bond, C. J. Brickwell, W. Cheffins, T. Congreve, J. Cressingham, W. Fisher Hobbs, C. W. Johnson, J. G. King, J. J. Mechi, T. Owen, T. E. Pawlett, B. P. Shearer, James Thomas, John Thomas, J. Tyler, W. Bullock Webster, J. A. Williams, and James Wood.

The minutes of last meeting were read, and the usual monthly statement of accounts received.

The following members were elected:
S. Copeland, Camden Town.
H. Harlock, Hills Road, Cambridge.
J. S. Jordan, Eastham, Driffield.
R. Solly, Mayland, Maldon.
J. Withington, Rosedale, Leominster.

The names of thirteen other candidates were read for the first time.

Mr. Henry Trethewy, of Silsoe, was elected a Trustee of the Club, subject to the appointment being confirmed at the next general meeting, in the place of the late Mr. Robert Baker, of Writtle.

A letter was read from Mr. Brandreth Gibbs, undertaking to bring the Club resolution on the subject of the dinner in the Show week before the next General Meeting of the members of the Smithfield Club.

A letter was read from Mr. Penthland, of Black Hall, Drogheda, Ireland, on the necessity for some further inquiry into the system of steam cultivation, and calling the attention of the club to the subject. The Committee directed that in answer a discussion card of the year should be forwarded to Mr. Penthland, from which he would find that the question would come on for discussion at the June Meeting of the Club.

The Committee heard with regret of the death of Mr. Joseph Pain, of Felmersham, Bedford, one of the oldest members of the Club, and who twice filled the office of Chairman, for the year 1850, and again in 1854.

ON INCREASING THE FECUNDITY OF OUR DOMESTIC ANIMALS.

CHINESE LIVE STOCK.

Sir,—I have been greatly interested in reading the various letters on double cropping, and on obtaining lambs early and twice a-year; because all this discussion tends to improvement, and an increase in our supplies of animal and vegetable food: for, if we do not travel quite so fast or so far as the enthusiastic advocate of any new system recommend, yet we are led into considering whether we cannot improve our present mode; and the crotchets of an enthusiast, passing through the brains of sensible, practical men, have often led to great results and large profits.

I therefore write to draw the attention of our agriculturists to the live stock and agricultural management of the Chinese, as affording us points which we may possibly improve upon. And first as to live stock: in all kinds the Chinese appear to have studied fecundity, early maturity, and aptitude to fatten. Their ideas of beauty are different to ours; but, by a process of crossing, or by employing Chinese animals as mothers and breeders only, with our pure-bred male animals as sires, we might obtain good results.

I begin with sheep. It was stated in a paper read at the Society of Arts on the 8th instant, that these sheep were introduced into England by Mr. Rutherford Alcock, Vice-Consul at Shanghae, who in 1854 shipped several of them as a present to Prince Albert. The Prince in 1855 presented three ewes to the London Zoological Society. Lord Ducie also had some; but, on the death of this lamented nobleman, the sheep were lost or dispersed. In the London Gardens the increase of lambs was so great that it was considered a nuisance. One ewe had five lambs, another four, and a third three, thus making thirteen lambs from three ewes. And not having accommodation, and not wishing to be overrun with Chinese sheep, which were not very attractive to visitors, the keepers actually used the lambs as fresh food for the lions and tigers, till the breed was extinct. Not without remembrance, however; for Mr. Bartlett, the Superintendent, in 1857 wrote to the effect that the sheep bred twice a year, and the lambs were easily reared by hand, and were perfectly hardy. The wool, though coarse, was of a useful kind, and in the opinion of the Bradford Chamber of Commerce, was then worth 1s. per lb. The Americans acted differently, and more sensibly. The introducer of them into the United States (a Captain Theodore Smith), who began with three sheep in 1854, in eighteen months had an increase of seventy-four, one of the sheep having had twelve lambs in fifteen months. He states the sheep as large and handsome, and the mutton of superior delicacy.

Mr. Pell, who purchased some of these sheep, states that he has sheared as much as 9lbs. of wool off each, and that so greatly were they appreciated, that he was selling them at five hundred dollars each to various friends. The lecturer recommends this breed as a means of rapidly stocking our Australian, New Zealand, and African colonies; and, when a large stock was obtained, to cross with the merino to improve the wool. In England he recommends crossing with the Polder Holstein breed, which also frequently produces five at a birth, and is a long-woolled sheep, yielding from 10 to 20 lbs. of wool each; this cross to be again crossed with the Southdown or Merino.

However, in England it appears to me that the chief use would be in producing an early and large quantity of lambs, to be fattened as such; the ram employed being a Southdown, to improve the form and quality, and cow's milk to be used to assist in rearing, if required. They also seem to be quite a cottager's sheep, as being used to hand-feeding and confinement, and therefore bearing tethering on roadsides; and, from the number of lambs, no doubt yielding much milk, which (the lambs being sold) might enter into household use. They would be a useful substitute for the goat, as less liable to wander, and more valuable in flesh and wool.

The Chinese pigs are well known in their crosses; they have diminished the size and increased the fattening property of many of our native breeds, the Suffolks for instance. It would be worth while employing them in a pure state as mothers only, crossing them with the Berkshire boar, to give increased size and better quality in the progeny. From experience in the pure Chinese I can state them as being very productive, good mothers, good constitutions, quick in coming to maturity and in fattening, and able to keep up their condition where those of large breeds got thin. But they are an ugly shape, reminding one of a fat Chinaman, and the bacon is of indifferent quality.

The Chinese fowls, Shanghai or Cochin China, are well known. Over-valued at one time, they are undervalued now; they are, however, quite a poor man's fowl, from being so completely domesticated and bearing confinement well, laying so great a quantity of eggs, and from their chickens coming so early to maturity. As producers of eggs and early chickens they ought to be the most profitable of all breeds. And a Dorking cock might be employed to improve the shape and colour of the chickens.

Ducks are kept to an enormous extent in China. Whether the plan of keeping them in large barges, surrounded with projecting stages covered with coops, so that the birds get most of their own living from the swamps and mouths of rivers, where these barges are moored, would be practicable in this country, is a question which cannot be answered till it has been tried. There are, however, many lakes and small islands where the experiment might be made. As the Chinese hatch the eggs by artificial means, their ducks lay a prodigious number of eggs; so that, if only as egg-layers, they would be an acquisition; the eggs in this country being, of course, hatched by other fowls.

Gold and silver pheasants and the orange-crested teal are natives of China; and several of the other birds possess great beauty of form and brilliancy of colour.

But the advantages the Chinese breeds will give us are principally fecundity, quickness of fattening, and complete domesticity. In this country, form and early maturity are often obtained at the expense of hardihood and fecundity. In reading the annals of Shorthorns, as published in your paper, this last defect strikes one forcibly; splendid animals, bought at an enormous price, will not breed, or have but one calf; and bulls are found perfect in every particular but the most important one.

The lecturer gave his opinion that the Chinese sheep are now extinct in England, and must be re-imported. But surely such a lover of agriculture as our Prince has reserved some of the stock on his farms; or they exist in travelling menageries, if not in the Zoological Society; or those at Lord Ducie's have been only dispersed, not altogether lost.

I must postpone to my next my remarks as to those Chinese plants and modes of culture that might be introduced into our system of cultivation.

Feb. 17. W. R.

HOW TO IMPROVE THE BREED OF HORSES.

If we are to bow to the invincible eloquence of the Chancellor, and to accept his opinion as a foregone conclusion, it may behove us to be at once looking about us. There are certain commodities in which Great Britain has still something of a lead, and that the farmer, as he chooses, may have more or less to do with. Let us instance at once our different breeds of stock. So long as we breed these with due care and judgment, so sure may we be of a good market for them. It is true there is a certain degree of rivalry springing up from those who go to beat us with our own weapons—when American horses win races at Newmarket, and English yeomen, as happened the other day, buy their Shorthorn bulls out of Transatlantic herds. But in the face of this, the demand for our horses and cattle threatens in no way to fall off. Only let them be as superior as they have been, and a thousand guineas may be had for a bull-calf, while the agents of Kings and Emperors try their best to out-general Mr. Quartermaine or Mr. Collins for the first offer of a charger or a hunter. It is only fair to add that the agriculturists themselves have been rather looking up this kind of animal of late. There is now scarcely a show ground, but has its especially attractive class of thorough-bred horses. These are good, bad, and indifferent, as a matter of course. Weeds, screws, and peacocks try their luck against something of a better stamp; for there are few quarters but have a high-mettled one travelling about, or stationed within handy reach. In fact, there is nothing easier to get at. Few commodities embrace so extraordinary a range of price. A sound, short-legged, blood horse, with a pedigree, action, and substance to back him, will command almost any price you may choose to ask for him; whereas, should the village publican or farrier have the misfortune to lose or the good fortune to sell his Young Eclipse or local Highflyer, he may run up to Tattersall's next Monday and buy another, as good or better, for a twenty pound note. Indeed, people tell you that the country is overrun with such cripples—that the English horse is terriby deteriorating—that good hacks and hunters are more difficult to meet with than ever—and that the old-fashioned race-horse, who could carry twelve stone over a four-mile course, is "a thing that is not." So, most assuredly, thinks Lord Redesdale, the chairman of the committees of the House of Lords, an ex-master of foxhounds, a thorough sportsman, and an excellent country gentleman. In his place in the Lords, he is recently reported to have said:—"The ridiculously light weights now carried in some cases led to gambling practices on the turf, and were, he believed, exceedingly prejudicial to the breed of horses. At one time Parliament imposed restrictions on the weights allowed to be run at races; and although the act had been repealed, the evil now prevailed to such an extent that although it might not be possible to remedy it altogether, something ought to be done. Everybody, he thought, would admit, that if a horse could not carry seven stone he could be of no use." And then his Lordship went on to ask the first reading of a Bill—that was read accordingly—and of which this is the chief clause:—"From and after the first day of January one thousand eight hundred and sixty-one, no person or persons whatsoever shall enter, start, or run any horse, colt, mare, filly, or gelding for any plate, prize, or sum of money, or other thing, unless such horse, colt, mare, filly, or gelding shall carry seven stone weight or more, computing fourteen pounds to each stone weight; and if any person or persons shall enter, start, or run any horse, colt, mare, filly, or gelding for any plate, prize, or sum of money, or any other thing, carrying less than the weight hereinbefore directed to be carried, such horse, colt, mare, filly, or gelding, or the value thereof, shall be forfeited, and the person or persons so entering, starting, or running the same shall forfeit the sum of two hundred pounds."

This is strong enough certainly, and as clearly well-intended. If the Bill should ever pass, it will almost revolutionize the present practice of the Turf, where pigmy feathers get most of the riding, and light handicaps are the attractions of a meeting. Horseflesh, however, is proverbially one of those open questions upon which everybody is sure to have an opinion. Our own is that the riding or race-horse has not deteriorated, but that the fault is rather with our method of treating him. In former times the four-miles King's Plate horse never appeared till his strength was matured. "Eclipse," himself, was never trained until he was five years old. Whereas, now an animal is put into work almost from the time he is weaned. *Yearling* stakes are coming into vogue, and a good colt's great value frequently centres in his second year's performances. One of the favourites for the Derby of this year—Mr. Merry's Thormanby—began racing last year as a two-year-old in March, and continued running all through the season, up to the very end of October. He started no less than fourteen times, of which he won nine. Now it is just possible that by the end of another year or so this colt may "crack." A leg may go, or he may turn roarer, or something or other may happen, so that the world may be able to say "There is another of those die-away castoffs, that could not carry his ten stone over the Beacon at five or six years old, like Hambletonian and Black Diamond," and so on. Whereas, Thormanby had done more by the time he had got through his two-year-old trials than these famous horses ever did in a lifetime. Moreover, in all these races, he but once carried less than 8st. 7lb., and far more frequently five or six pounds more. If Lord Redesdale really means to correct the handicap rage by insisting on heavy weights, let him go on with his bill as it is. But if he wants to do far more than this—to improve, or, as his lordship might word it, to re-establish our breed of horses—he must go further. He must do away with the system by which young horses are far too severely tried before they are fit for their work. So far from being deteriorated, we really believe that if our best horses were kept back until they were fairly seasoned, they would lose the Highflyers of a by-gone day over the Round Course at Newmarket. As regards hunters, there must be infinitely more kept in Great Britain than formerly; and as regards their prowess, the flying Leicestershire horse, or of the Pytchley, or of the Vale, would gallop round and jump up over the good old-fashioned, short-tailed crop-eared animal that did duty when hounds hunted up to their fox instead of racing him down. Clever hacks we fear are scarce, and great heavy-crested "Castle" cobs, we are glad to think, are going out of use. Still it will never do to go about, on such premises, with the broad assertion that the English riding-horse has sadly deteriorated, and that we can never be carried as our forefathers were. Nevertheless the movement is quite in the right direction. But let Lord Redesdale go on to complete his good work. Let him do away with very short courses, the three furlongs, a quarter of a mile, and such like distances. Let him, again, make it one of his chief points not to have horses put into training too early. Of course his scheme, as it is, will be regarded in many quarters as a most monstrous attempt at undue interference; but we should have appreciated the bill far more, had it run on to enact that no race-horse should carry less than seven stone, that he should never run before he was three years old, and that no course should be of a less distance than a mile, or perhaps two. Let his Lordship also consider how far practicable it would be that a stallion should be "passed" or "licensed" before he was suffered to travel; and how such Acts as those which exempt animals under a certain height from the payment of any duty, actually affect the different breeds.

This measure proceeds from a very high source. We repeat that the aim is an excellent one, and at any rate we should like to see it fully discussed, and by none, incidentally, more so than by the farmers themselves. No class has suffered so much from the use of rips, weeds, screws, and cripples; and if we can help them to a better sort they may, perhaps, eventually be able to make a better business of horse-breeding. At present they are not equal to the demand.

THE OUT-GOING TENANT.—ROSIER *v.* OVERMAN.

The world is getting more and more averse to "scenes," and "rows," and unprofitable quarrels. The fine gentleman of a bygone era plumed himself upon the placidity of his demeanour either in receiving or avenging an insult, and ran his adversary through the body with the same calm smile he might have asked him to take a glass of wine. Although we now scarcely proceed to such extremities, we are equally inclined to make as little fuss as possible over our misunderstandings. We do not hasten either to push our disturbances to an issue without very good cause; and even then the losing side loses far more than the mere matter in question. The defeat hangs to him. People remember it hereafter, and his discomfiture is continually rising up in judgment against him. In fact, we do not want these exposures and recriminations. Take either the highest or the lowest orders of authority, and the feeling is still the same. When counsel, having been instructed to vilify each other's clients, are as duly proceeding to do so, his lordship interferes. The Court does not care to hear all this sort of thing, and the point had far better be referred for private adjustment. Or, even when Betsy and her missis find they must part, it is quite as well to get through the month's warning on good terms. The saucy jade who slams the door after her as she leaves, and the terrible termigant who runs on at her until she is fairly out of sight, neither of them profits much by such conduct. The place gets a bad name, and the girl goes after another with a damaged character.

If in all classes of life these unseemly bickerings are to be avoided, in none should they be more so than in the relation between landlord and tenant. The very welfare of either may greatly depend upon the proper observance of a good understanding. A touchy, exacting, over-punctilious landlord, "who picks a quarrel if you step awry," is a man we instinctively fight shy of; while the slovenly, never-do-well tenant, who always leaves things worse than he found them, is, from his very position, yet the more mistrusted. Only let two such men get thoroughly to loggerheads, and there is no end to it. There are customs to rake up and covenants to quibble over, and facts to be sworn to—either way, of course—and definitions to be played at, and other such expensive amusements to be indulged in. Unfortunately the mischief is rarely confined to the prominent parties to the suit. A partizan spirit is sure to develop itself in the neighbourhood, and much ill-feeling is the consequence. Even quiet people are forced to interfere, and to give their opinions on the merits of the case, "Was this good farming, or was it not?" And so on, until they get thoroughly involved in the dispute, and into something like direct hostility with those they had no intention to offend.

It was, then, with considerable regret that we had, a few weeks since, to give the particulars of "an important arbitration case," as it was called, held at Luton, in Bedfordshire. It was a grave dispute between a landlord and outgoing tenant, involving a sum of no less than six hundred pounds. Mrs. Rosier, a lady of landed property, residing at Marlow, near Boxmoor, in Hertfordshire, was the complainant; and Mr. Overman, a name standing well in the annals of agriculture, the defendant. Mr. Overman, it appears, came to the end of his lease in the autumn of fifty-eight, when he prepared to and did leave his farm, as Mrs. Rosier had then determined to put her own son in it. So far, however, from there being any ostensible ill-feeling between them, when Mr. Overman accidentally meets the lady in a railway-carriage, he offers a rise of one hundred and twenty-five pounds on his last rent to continue his holding, not asking for any repairs, as he considered there were none required. So far, and no people could promise to get quit of each other on better terms. The lease was out, and, as one of the owner's family was coming in, the tenant could, of course, only go. There was no other man of his own order preferred to him; and so far from any apparent ill-feeling arising out of the leave-taking, the two have a friendly chat on the subject the first time they meet. But some evil genius must even then have been at work.* They do not march quite with the spirit of the times in Hertfordshire; and two people, who have been for years together, cannot part without a row or a squabble. To the tenant's expressed surprise, he receives a specification that many "repairs" were required to be done by him. "Whether," as the charges ultimately ran—"1st. Whether the lease of Flamstead Bury farm for a term of 14 years was duly executed on the 12th day of November, 1844. 2ndly. Whether the defendant did or did not, from time to time, and at all times when and as often as need or occasion required, well and sufficiently repair, amend, uphold, sustain, preserve, and keep in good and tenantable repair, the said demised messuage, farmhouse, and the several barns, stables, granaries, outhouses, gates, stiles, posts, rails, and fences thereto belonging; and whether he did or did not, during the said term, suffer or permit the said premises, &c , to be or continue ruinous, prostrate, fallen down, or in decay, in bad order, or repair, for want of needful or necessary repairing, amending, upholding, sustaining, preserving, or keeping in good and tenantable repair as alleged. 3rdly. Whether the defendant did or did not, at the end or expiration of the said term, yield up into the hands of the plaintiff, and to the assigns of the said John Hotchkiss, the said farmhouse and premises, &c., in such good and tenantable repair as aforesaid; and whether he did or did not refuse so to do, as alleged. 4thly. Whether the defendant did or did not, at every time of his cutting, plaishing, and new-making the said hedges of the said demised lands and premises, cleanse, and scour up the ditches belonging to such hedges as aforesaid, and to the hedgerows where ditches had, before the making of the said demise, been formerly made, and especially all the outside ditches; and whether he did or did not neglect or refuse so to do, as alleged." In the April of last year, following the original specification, Mr. Overman is served with a writ, and enters an appearance to defend an action. The trial is set down for the summer assizes at Hertford, when it was made a remanet. Then it is removed to the Court of Common Pleas, Westminster, is part heard, and a number of witnesses examined, with Mr. Bovill, Q.C., and Mr. Garth for the plaintiff, and Mr. Edwin James, Q.C., Mr. Hawkins, Q.C., and Mr. Codd for the defendant, all duly instructed by the several solicitors, of course. At length, however, after much investigation and pleading and examining and so forth, Lord Chief Justice Erle interposes, and suggests that the case be settled by arbitration; and this is agreed to accordingly. Mr. Henry Trethewy, of Silsoe, the agent to the De Grey property, and a gentleman of great experience and practical ability is selected to finally decide these unpleasant and expensive differences; and the third, and as we hope the last time of asking, was heard before him at Luton, in January. Here the Q.C.'s were dispensed with; but Mr. Bedford, and Mr. Smith, of Richmond, Mrs. Rosier's family solicitor, went to show how the barns, stables, gates, and stiles were not kept in tenantable repair, and how the hedges were not cut and plaished, nor the ditches cleaned and scoured, all according to that "said" intelligible language in which the law delights, and on which the issues were joined. On the contrary, Mr. Day, of Hemel Hempstead, maintained that the premises were in repair, that the hedges were cut, the ditches scoured, and so forth. And for three days did Mr. Trethewy sit in state at the George Hotel. For three days were more than thirty witnesses living at the suit Rosier and Overman in the pleasant little town of Luton. For three days did some of the first agriculturists in Bedfordshire and Hertfordshire, "including some of his Grace the Duke of Bedford's tenants, so famed for their high farming," crowd the room. And for three days did land-valuers and farmers and bailiffs and labourers and neighbours and the present tenant and the past tenant tell all they knew of Flamsteadbury Farm, and how Mr. Overman left it. Then the arbitrator took the evidence home with him; to weigh carefully over, how much this going to Hertford Assizes; and then going on to the Court of Common Pleas, with the Q.C.'s, and the Lord Chief Justice; and then coming back to Luton again—how much this trouble and expense, and wear and tear of mind and body were really worth? How much discredit these untenable premises and unshorn hedges and dirty ditches did to the name of Overman? Silence in the Court:—"I, the said arbitrator, having taken upon myself the burthen of this reference, and having heard and duly weighed and considered the several allegations of the said parties, and the evidence produced by them respectively, of and concerning the matters in difference, so referred to me as aforesaid, Do make and publish this my award in writing, of and concerning the matters so referred to me, and do hereby award, order, determine, and direct in manner following, that is to say, As to the issue firstly joined in this cause, I award and find for the plaintiff; and as to the issues secondly, thirdly, and fourthly, joined in this cause, I award and find for the defendant; and I direct and award that the verdict which has been entered for the plaintiff be set aside, and instead thereof a verdict be entered for the plaintiff on the first issue, and for the defendant on the second, third, and fourth issues. And as to the matters in difference between the parties other than those in the said cause, I find and award that neither of them are entitled to any claim upon the other in respect of the same. And I further award and direct the plaintiff and defendant do each bear their own costs of the reference, and that the costs of this my award shall be paid by the plaintiff." This is, of course, a verdict in full for the defendant; the first point, asserting the execution of the lease, being a mere matter of form, which was at once admitted. The award, we believe, carries heavy costs.

We tell this story through, purposely, without comment of our own. But surely there is something of a moral and a warning, attached to it. If this be not already so apparent, let us enforce it by one further fact. When the decision was known in Redbourne and Flamstead, the Parish Bells were set ringing!

THE MOLE-CATCHER.—The common mole-catcher, like the rat-catcher, belongs to a dubious class of persons, who prefer a half-lazy life to the varied and honourable toils of the farm-labourer. And yet the old proverb, suggesting the pains to which idle people put themselves, has some illustration in his career. As his occupation is confined to those seasons when it does not materially interfere with the crops, his traps cannot be set for several months together, and the frost of winter often prevents the pursuit of his calling or interferes with its success. If, then, by any means he can eke out a subsistence, he may cherish his indolence as he lists. But let him obtain a job, and then truly it is no joke; for, exclusive of the labour and delay in setting his traps, he frequently walks more than twenty miles a day; and this, for the most part, neither along good roads nor well-beaten paths, but over hedge and ditch, from farm to farm, and from field to field, on the lands of the owner or the occupier who contracts with him to destroy the moles. It is singular that this work should not be undertaken by persons living in the neighbourhood of the places where their services are sought. Yet, over a considerable extent of Scotland, as well as Wales, the moles are destroyed by catchers who belong to some of the northern counties of England. They visit their employers at regular periods of the year, when their appearance is anticipated by the Scotch and Welsh farmers as certainly as the coming of the Irish haymakers and reapers is in the meadows and cornfields of England. The war they carry on with the moles almost amounts to one of extermination. The numbers that have been annually slaughtered are enormous. Mr. Bell, the eminent naturalist, states that Mr. Jackson, a very intelligent molecatcher, who had followed the craft for thirty-five years, had destroyed from forty to fifty thousand.—*Cassell's Popular Natural History.*

CALENDAR OF AGRICULTURE.

Sow oats and barley on dry lands, and in dry weather; also vetches, peas, beans, and flaxseed. Sow lucern on well-prepared ground, trenched, or very deeply ploughed, and richly dunged. Sow carrots and parsnips; best on rich warm sandy loams, in good condition from previous usage, without the present application of fresh manure. Steep the seeds in leys of urine, and dry them with lime. Sow sainfoin, and dress the young plants with gypsum. Apply artificial manures as top-dressings on young wheats, barleys, and clovers; soot and salt, malt coombs or rape dust, nitrate of soda, pigeon's dung, and gypsum. Sow cabbage seed for summer plants, and lay composts on grass lands.

Plant hops, and place the hills six feet distant each way; apply well-rotted dung, and put four sets in each hill, one in each corner, and cover them lightly with earth, leaving the upper end of the set just in light of day.

Continue the planting of forest trees, and of young hedges; but cease if dry weather sets in. The cutting of underwoods will now be finished.

Watered meadows may now be stocked with light animals. Set traps for vermin, and spread molehills.

Plough fallows for green crops, and also clay lands for bare fallows, if the weather be dry. Shut up the fields that are intended for hay, and finish laying composts on grass lands. In wet weather thrash grain, and carry manure from the yards to heaps in the fields.

In some, or rather in many situations, this month is the busiest with the ewes dropping lambs. Feed largely with juicy succulent food, as beet, cabbage, and turnips; and use the necessary shelter, which in many situations is as necessary as the food itself. The shelter sheds must be littered frequently to keep them dry; best with chaff and very short straws. Remove the ewes and lambs to the pasture fields from the lambing ground regularly, as the lambs get strong.

Keep the poultry houses dry and warm, and set all kinds of eggs for hatching; feed well, and provide clear spring water.

Finish the killing of hogs for bacon, and keep all young pigs for summer stores, and for early feeding next winter. The last fattening bullocks must now be sold, or pushed forward by superior feeding. The long days will now require a greater supply of food, as daylight always induces animals to eat more.

CALENDAR OF GARDENING.

Begin early to dig, manure, and sow plots for the main crops of peas, beans, and all the summer vegetables. Sow carrots on sandy loams without fresh manure; beet and parsnips on stronger lands, with dung placed low in the ground.

The soil must be rich for cabbage, Brussels sprouts, cauliflowers, and kales; cauliflowers over dung in trenches under the roots; guano water is a good manure for them.

Transplant and sow summer-hearting cabbage. Sow Dutch red cabbage seed, and green curled savoys for Michaelmas.

Sow the best French lettuce seeds, round spinach, and repeat in every three weeks; the winter prickly spinach will yield freely in showery weather.

Sow early in the month the true Spanish onions, for large bulbs, and the others, being for mere common kitchen use; the ground should be deep and rich. London leeks are sown to be transplanted.

Sow radishes on light and rich grounds that are moist and warm: a frame and lights are always advantageous; a sprinkling of Dutch turnip, a little celery for succession, small salading, and nasturtiums for pickle, parsley, basil, and pot herbs, namely, fennel, dill, borage, burnet, chervil, are to be sown during the month.

Plant thyme, sage, marjoram, lavender, rosemary, and rue.

Plant early potatoes, ash-leaved kidneys, champions, and others that ripen in August, on peaty and sandy lands; two settings are sufficient for the season.

Plant trees or shrubs by the middle of the month; puddle-in the roots, and cover with dung, or drought may set in, and fatally check the growth.

Sow hardy annual flowers by the middle of the month, as dianthus, Indian pink, cockspur, mignonette. The half-hardy are reared in frames. Herbaceous plants may now be set or divided, and put into new situations.

Cut box, plant edgings, and turn over gravels, or put down fresh; sweep lawns, and keep every place in neat order.

Keep a pit, bricked or cemented, to receive all litter and vegetable refuse, the straws and droppings of dung, wetted occasionally with liquids and suds from the dwelling-house. A good manure is thus obtained, even by those who keep neither horse nor pig.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR FEBRUARY.

The numerous changes in the weather, and the partial continuance of a somewhat severe frost, especially in the north of England, have more or less interfered with the progress of out-door farm labours; nevertheless our accounts mostly state that they are seasonably forward, and that the sowing of Lent corn has commenced in the southern counties. The land, however, has not worked well, and we regret to state that the winter wheats are looking far from promising. We find that in several parts of England vegetables, almost generally, have suffered severely from the frequent atmospheric changes; indeed, in some districts the supply is unusually small even for the time of year. Potatoes, too, have shown increased signs of decay, and the result is that prices have further advanced. Some parties contend that the supplies of that esculent on hand are not equal to a month's consumption. This statement, however, we are much inclined to doubt; nevertheless we admit that it would be unwise to calculate upon larger quantities of an improved quality than those at hand since we last wrote, more especially as the importations from the Continent have fallen off considerably. The deficiency in the stock of sound potatoes has led many persons to assume that we shall shortly have considerable activity in the wheat trade, and with it higher prices. That there is room for an improvement in them may be freely admitted; but whilst buyers continue to operate for immediate wants only, whilst there is a total absence of speculation, and whilst the granaried stocks of foreign continue large, we can, we think, hardly look forward to any excitement in the trade; nevertheless it is just possible that the quotations will gradually harden, say to the extent of 3s. or 4s. per quarter; but if actual supply is to govern value, the chances are more in favour of steadiness in the demand than extensive fluctuations in value. Not that we apprehend any great increase in the importations of either wheat or flour during the present compared with the past year; but it is, we think, fully apparent that our farmers still hold a large quantity of wheat, both in stock and barn, when compared with the general run of years. On this ground, therefore, we assume that there is no reason to look forward to any great activity in trade. The demand for all descriptions of spring corn has continued to rule steady, at very full prices. Fine barley, from its scarcity, and from an increased inquiry for sowing purposes, has sold at very high rates, 48s. and even 53s. per quarter having been realised for it. The limited nature of the importations of spring corn has led to some heavy transactions *ex* granary; hence the stocks, both in London and at the outports, have been considerably reduced.

The fat stock markets have been tolerably well, but not to say heavily, supplied. Trade generally has ruled firm, and the quotations have continued high. The dead markets have exhibited large quantities of meat, and which, as a matter of course, have come into competition with live stock. The enormous consumption going on, however, has prevented any fall in the quotations of either beef or mutton.

During nearly the whole of the month, the wool trade has been in a very unsatisfactory state. English qualities have receded in value, and other kinds have met a dull inquiry, at barely stationary prices, although the importations have not been to say extensive, and although only about 40,000 bales will be offered at the present series of colonial wool sales. The advance in the value of money has, no doubt, had some influence upon the demand; yet, when we consider that the supply of wool in the hands of the manufacturers is very limited, and that our export trade in goods is active, we are of opinion that prices are more likely to advance than recede.

There has been an improved demand for both hay and straw, and, in some instances, prices have had an upward tendency. The supplies brought forward have not increased.

The stock of root crops is still large, and the sales for both linseed and rapecakes has been in a very inactive state, notwithstanding that the arrivals from the continent have continued on a very moderate scale.

Wheat, Indian corn, and oats have been in improved request in most of the Irish markets, and prices have ruled firm. Other produce, however, has moved off slowly, at about previous currencies. The shipments to England have continued on a limited scale; whilst the stocks of produce in the hands of the growers are represented as very moderate.

The Scotch markets have, for the most part, been fairly supplied with wheat, barley, and oats, yet the demand for those articles has continued steady, at full quotations. Some extensive shipments of barley and oats, in good saleable condition, have been made to the South—a proof, in our opinion, that the yield last year was far more extensive than was at one time anticipated. The stocks on hand are, we understand, still in excess of the corresponding period in 1859.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that full average supplies of fat stock have been on offer in the leading cattle markets, the trade generally has continued in a healthy state, and prices have been well supported. With very few exceptions, the beasts received in the Metropolitan Market, from Norfolk, have been in good saleable condition; hence, the supply of meat, as to quantity, has rather increased. The receipts from Scotland—especially the crosses—have proved first-rate stock; but those from Ireland have continued limited. We learn, also, that the Irish beasts have not turned out so well for general consumption as in many former seasons. Owing, chiefly to the great activity in trade and commerce, consequently to the large consumption going on, the beef trade has ruled firm, at very full prices. The arrivals of sheep have been tolerably extensive; but a scarcity of really prime breeds has been complained of. On the whole, the mutton trade has ruled active, at further enhanced quotations, 5s. 10d. and even 6s. per 8 lbs. having been paid for some very superior Downs. Lambs have sold slowly, at prices varying from 5s. 6d. to 6s. 10d. per 8 lbs. Calves and pigs have commanded more attention, at extreme rates.

In consequence of the saturated condition of the soil, the sheep have suffered considerably from the foot disease. Beasts, however, have not shewn any serious signs of lameness. The annexed return shows the total numbers of stock exhibited and disposed of in the Metropolitan Market:—

	HEAD.
Beasts..	19,750
Cows	322
Sheep	87,536
Calves..	974
Pigs	2,094

COMPARISON OF SUPPLIES.

Feb.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1859......	17,694	499	79,691	1,034	2,557
1858......	18,276	466	69,070	1,091	1,559
1857......	17,629	457	74,430	1,172	1,975
1856......	19,642	495	99,950	673	2,614
1855......	17,436	385	91,180	596	2,705

The arrivals of beasts from Norfolk, Suffolk, Essex, and Cambridgeshire have amounted to 10,920 Scots, shorthorns, and crosses; from other parts of England, 3,500 of various breeds; from Scotland, 1,700 Scots and crosses; and from Ireland, 307 oxen and heifers.

Advices from Holland state that both beasts and sheep rule high in price; and rather an important rise has taken place in the quotations in Spain. The imports into London in the past month have been as under:—

	HEAD.
Beasts	1,494
Sheep	4,395
Calves	1,066
Pigs	63
Total	7,018
Same time in 1859	7,809
" 1858	2,320
" 1857	4,720
" 1856	3,087
" 1855	2,839
" 1854	10,683

Beef has changed hands at from 3s. 6d. to 4s. 10d.; mutton, 3s. 10d. to 5s. 10d.; veal, 4s. 6d. to 6s.; pork, 3s. 6d. to 5s. per 8lbs. to sink the offal.

Immense quantities of meat—over 60,000 carcases—have been received up to Newgate and Leadenhall markets from Scotland and various parts of England. Notwithstanding that sales have progressed slowly, prices generally have been well supported. Beef has sold at from 3s. 4d. to 4s. 4d.; mutton, 3s. 6d. to 4s. 6d.; veal, 4s. to 5s. 4d.; pork, 3s. 6d. to 5s. per 8 lbs. by the carcase.

CUMBERLAND.

The second month of the year is now nearly ended, and still the same severe wintry weather prevails that characterized the whole season, almost, it may be said, from the middle of October. Frost, snow, and rain have followed each other in rapid succession, while the transition to and from the one to the other has been remarkably sudden. February commenced in a way calculated to prove the truth of the old adage, "February fill the dyke either with black or white." Much snow fell in the early part of the month; but although the frost still continues severe, not much snow has fallen this last week or two. This unusually severe winter has not been without its necessary effect. What green crop was left exposed to its influence in the fields has suffered severely, being almost entirely destroyed. Turnips were a miserable crop to begin with, in consequence of their all but entire failure, being nothing like a tithe of a usual crop, and soon cleared off by sheep, which were hurried off to market from want of further keep, very few being left to supply the wants of the butcher; the price of mutton consequently rules high. The loss of the few turnips left to draw off for store cattle, and nothing for young cattle to be had by turning them out into the fields an hour or two each day, which would have been the case had the season been a mild one, like the winter was that succeeded the droughty summer of 1826—these causes combined makes the draw upon the scanty supply of hay and straw difficult to sustain. And how some will be able to "tide over" until grass comes, is not easy to foresee. Candlemas being the usual time for leaving and entering upon farms in Cumberland, the customary sales on leaving farms took place before Candlemas. The general custom is for farmers to keep up their usual stock of cattle, and feed them as usual in the farm buildings, and thus consume a fair proportion of their fodder, and what remains they are allowed to sell to be taken off the farm. This is the custom where there is no special agreement. At those sales which have taken place, the crop has been selling at very high prices. Notwithstanding the low price of wheat in the market, on account of the scarcity of fodder, wheat stacks have been sold at prices which, when thrashed, will be at the rate of about 40s. the Carlisle bushel of 3 imperials, or about 104s. or 105s. a quarter; other kinds of grain in proportion. Notwithstanding the high price of, and the difficulty there is to procure, keep for stock, cattle were also bringing high prices. Wheat straw is a ready sale at sixpence per stone (14lbs. to the stone), and hay, &c., proportionately high. But, after all, the difficulty with farmers, owing to the great scarcity of keep, will not be without some good result. It is a trite saying that "necessity is the mother of invention;" and the result of the temporary evil will be that other modes of preparing food for cattle will be hit upon that would never have been thought of had it not been for the difficulty arising from the shortness of keep. Amongst other things, it has caused a great demand for straw or chaff-cutters, the sale of which has been upon a large scale. This chaff, scalded with hot water, in which meal or bruised linseed-cake had been boiled, is found to make an excellent feed for cattle, and much relished by them. Farmers are beginning to say that it will not be necessary to draw so many turnips off the land; that it will be better to provide other food as a substitute, and consume more turnips on the land by feeding them off with sheep. If this be so, it will at once be seen that a great saving in labour would be effected, as loading and storing turnips is a heavy item in labour, while the land would be improved by the crop being consumed upon it, and much injured by being trampled and carted upon in loading the crop off. Field labour is necessarily very backward, from the severity of the season, and the grass fields have a very wintry and dead-like appearance. Wheat that was sown early upon bare fallow came well, and still looks promising; but the later sown, after green crop, was long in making its appearance, and wears a kind of yellow, instead of its usual green colour. Wheat is a hardy plant, and will probably turn out better than its present appearance would seem to indicate. There is still a portion not yet got in, which must remain over for spring seeding. The price of wheat continues without improvement, and with little prospect of an early advance. The deficiency of fodder has caused it to be thrashed freely, and thus has kept the markets heavily supplied. Summer will find the stack-yards emptier than has been the case for many years back. There will likely be a shorter supply for market during the summer months, which may probably cause a reaction in the price. Barley continues much about the same in price, with very few good malting samples at market. Oats bring the highest relative price, and are the most deficient in quality, being exceedingly light and small in the grain. The markets for store cattle have not yet opened, and it is to be feared that they will appear in only poor condition. Horses have been selling at better prices than might have been expected, and the backward state of farm work will increase the demand. Good ones are as usual bringing high prices, and inferior ones are difficult to sell; but useful horses will find a market. Fat cattle are scarce and dear, and so are fat sheep. It will be no easy matter for the butchers to meet with a supply until grass-fed stock are ready for market. Fat pork is selling well, being worth from 7s. to 7s. 3d. per stone of 14lbs. without offal; so bacon curers must be looking forward to good prices for bacon before they can expect to realize a fair profit.—Feb. 23.

WEALD OF KENT.

The winter months are passing rapidly away, and not without the ordinary winter weather. Since November the brooks and rivers have been overflowing their banks, flooding all low places, numbers of acres having been under water for several weeks. The land is in a very wet state, and all out-door work is almost at a stand. Dry weather is much wanted, farmers being anxious to get in their Lent corn. We hear of several complaints about the wheat plant, which is looking sickly from the effects of so much rain: a few dry bright days, however, would soon alter its appearance. Sheep have required great care and attention. Some of our flock-masters have experienced heavy losses, which will be felt by the prices, which must rule high for some time to come. Meat of all kinds sells well, and prices are remunerative. The yield of corn generally has proved to be quite an average. The condition of most of the wheat samples brought on the market since Christmas is deplorable, and several parcels have had to be kiln-dried, to render them fit for use. Dry samples are much sought after, which are few and far between, and command high rates compared with those out of condition; this no doubt helps to keep the market in that dull state in which it has been for some time. The hop trade has received such a blow from the hands of that clever free-trader, whose dealings with the home-producer is anything but honest, that we fear it will be some time ere it recovers itself. The present Chancellor of the Exchequer can be no friend to the British producer, otherwise he would have better considered their position as regards the malt and hop duties, which press so heavily on not only the producer, but also the labourer. A removal of these imposts would have been far more consistent towards the agricultural body than the remission of the two millions of customs' duties from luxuries, which can never benefit the labouring classes.—Feb. 25.

LEICESTERSHIRE.

For the past two months the weather has been exceedingly various, with sudden changes of temperature, severe frost being succeeded in a few hours by thaw, and a great rise in the thermometer with heavy rain following. The past month may be noted for its great rainfall, 3·12 inches, being double an average. This may be considered rather an advantage than otherwise, as, from the small quantity of rain which has fallen in the past three years, the springs had become very low, wells dry, and water very scarce in the ponds where no running streams abound. We had hoped that the following month would have partaken of a milder and more serene atmosphere; but in this we have been disappointed, and we have been visited with severe frosts, frequent showers, but no great amount of rain, only 0·44 inch up to this date, and very little snow. This untoward weather for so long a time has been very perplexing to the tiller of the ground, as very little progress could be made in preparing the land for spring cropping. Fortunately, the harvest was early, and the corn cleared off the ground sooner than in most seasons; and it was in a forward state in the autumn, and a great breadth was cleaned and laid-up, to receive the wheat-seed in good time, and much now is ready for the spring-seed on the stale furrow. From the early frost, followed by such intractable weather, no progress could be made in sowing the land from which root-crops had been removed; and there remains a considerable breadth unsown which was intended for wheat. It will be a matter of some consideration, whether this land should be sown late with wheat, or early with barley, the best samples of this grain being worth nearly as much as wheat; but the chances of a good crop are in favour of barley. The weather, which we above described, has not only prevented work being done freely on the farm, but has been lamentably destructive to an immense quantity of roots. We apprehend two-thirds of the finest crop of mangolds have perished by the severe frosts in October, and scarcely less damage has been generally done to turnips. Even the hardy swede has succumbed to the inveteracy of the temperature, and where any are now left they look as brown as paving stones, with not a morsel of green to be seen, and when examined, they crush up rotten like a sponge filled with water. Though we have seen seventy winters we never recollect one in which more havoc has been made with roots than in this; we have known as severe with a longer duration of frost, but in those cases the crops have been protected by a good covering of snow. There was a good supply of grass in the pastures in the autumn, which promised much keep for sheep, and gnawing for cattle in the winter; but the weather has had such a destructive influence upon it, that but little now remains of good quality. Under these circumstances it must be evident that much difficulty will prevail in keeping both sheep and cattle up to the mark till the spring. The greatest caution has been necessary in feeding stock with the nearly rotten roots, but no ill effects have resulted where a suitable mixture of dry food has been given; and it is surprising how well the beasts have eaten the mangold in the fold-yards where well foddered with straw; and a large quantity of these roots have consumed in this way, unfortunately, a large bulk which would have been held over till the spring, had they not been frozen. Sheep even now eat the spongy, watery swedes better than could be supposed, where the land is dry, that they can be penned upon them, but there is great hazard attached to this plan unless they are supplied with a good portion of oats cut in the straw, with a little cake or pulse, and they are doing tolerably well where thus fed. We believe that the potato camps, where effectually secured from the frosts, open better than was expected, and there are not so many diseased bulbs as were anticipated. They are dear; selling at from 4s. to 5s. the bushel. On the diseases among stock, we regret to remark that a great loss has occurred in lamb-hogs; even, in some cases, to the whole of the flock—this prevails in the greatest degree in the grazing districts where they have been depastured on grass. This epidemic is not the diarrhœa, and there are different opinions as to what cause the disease is to be attributed; there is little doubt but it is a pulmonary affection, accompanied with fever; however, where it attacks, it defies medical skill, and generally proves fatal. This is a serious loss to the grazier, and will cause sheep to be scarce, and consequently dear in the spring. We do not hear of any fatal disease among cattle, but many herds are suffering from the mouth and foot disease, yet we hope, in rather a modified form; still, it backwards their condition, and is most felt in dairies, as it frequently causes inflammation in the bags, and spoils the milk. The vigorous weather we have experienced for the past three months has not only destroyed the greater portion of the roots, but put in jeopardy the young wheat plant. From the severe frost setting in immediately after the first wheat sowing (for the thermometer wrote 4, 8, and 9 degrees below freezing on the 23rd, 24th, and 25th October), the seed lay a long time in the ground, and did not appear on clay soils till late in November, and was caught by the intense frosts of December, in its most tender state. Were it not a provision of the Almighty that the nature of this plant, which produces the staff of life, renders it almost impervious to the severity and changes of temperature in this climate, serious apprehensions would arise for its safety in a winter like the present; and no doubt some mischief has been done, but we hope not to such an extent as to prevent its recovery. Undoubtedly the crop exhibits a great contrast to the flourishing one of this time last year, as it now appears generally weakly; yet the plant comes regular in the drills, and, from the severity of the season, we conclude it is not likely to suffer damage from insects. This is certainly calculated to excite gloomy forebodings as to the future; but we have frequently known changes take place so rapidly in former years that we do not participate in such fears; and it is far too early to form conclusions as to what will be the result when the crop arrives at maturity. No progress has yet been made in putting into the ground pulse crops, though this is the time when that work is usually in full operation; but it scarcely appears possible this season that much can be done till the searching winds of early March have swept over the wet and frozen furrows, and dried them sufficiently for this work to be accomplished. We must console ourselves with the old adage, "Sow beans when you will, they'll not come up till April." Our markets have had a better tone of late, and an advance of 2s. or 3s. per quarter has been established in wheat, and barley continues to fetch high prices, but from the variety in quality, the range is very wide—wheat from 43s. to 52s., barley 30s. to 44s., oats 25s. to 34s., beans 52s. per quarter. The stock of wheat in farmers' hands is considered large; still, from the small quantity imported, we are of opinion that prices will yet advance. Though very little outdoor work as regards working the land could be done of late, our labourers have been tolerably well employed, with wages for best hands 12s. per week. There is a lull in the wool trade, and but little doing; but this arises from the uncertainty of political events; and we do not apprehend there will be much life in the trade till the commercial treaty with France, and the Budget, have been finally disposed of by Parliament.—Feb. 25th.

SOMERSETSHIRE.

Spring sowing has commenced and is making rapid progress, the land being in excellent condition and the weather propitious, making up for the lost time the latter end of last and commencement of this month, when the land was thoroughly soaked. The frost which commenced the dry season we are passing through prepared the land; it gradually lessened, and we had several days of cold dry wind, with some slight snowstorms and showers; the snow lay on the ground in the western part of the country, and, except in this locality, there has been an uninterrupted preparation of the land, and farmers have committed peas and beans to the soil for another crop. Of the former very few are being planted, but of the latter a great many appear likely to be drilled, as this has almost entirely superseded planting. I should have noticed the little spring sown wheat now nearly accomplished, to a much less extent than usual. A demand has sprung up for barley for seed, and there will be an effort to put in a large breadth of this grain; it paid the best, and sold well, and at present there is quite a scarcity of samples—not equal in supply to the demand. White wheat is less enquired for, and is in better supply. We shall have a good deal to do in the next month, as the season is rather backward, as to the labour needed to prepare a crop. These dry and cold winds are seasonable, although retarding the growth of grass: the hay is not so wasted, still it shrinks very fast, and has already lessened the eagerness to buy grazing stock, for the root crop does not afford that abundance as last year, and there is now the appearance of early spring food, which gives hopes of a lessened consumption. Grazing stock has decreased in value, and there is not that quick sale for sheep, a good many half fat being thrown on the market for fear of food getting short; for really good fat mutton there has been a good demand at high prices; fat sheep have been less scarce than was expected, and have barely maintained high prices; mutton a little higher, 8d. to 9d., beef 6½d. to 7d. per lb. Fat pigs have rather advanced, there being very little to fat them with except corn: the prices are 9s. to 10s. per score, and not a large supply. The lambing season has commenced, and it is spoken rather favourably of, and not such great losses as some years, but is short for couples, and not favourable for early fat lambs. Cheese has been stationary, but there is not that eagerness to buy cows and calves as last year, and the prices are rather lower: to wean calves there is more disposition, and those fit sold at fair prices. Our wheat on ground is backward, but looking well set yet, except on the low land, where it has been under water, and injured by the season. Winter beans look on the whole well. Our prices for wheat have been stationary, but the quality is now much improved: for six weeks they were very damp, and a much larger quantity of the white is grown and damaged by the wet than was expected, and when the old is exhausted the best sound new will be in a small compass, and will be sought after. The yield of the new is bad, and the weight nearly 2lb. per bushel less than last year. Fine old white wheat 6s. to 6s. 3d., new 5s. 10d. to 6s. 1½d. 63 to 64lbs. per bush., red 5s. 3d. to 5s. 9d. 60 to 63lbs. per bush.; grinding barley 3s. 9d. to 4s., malting do. 4s. 3d. to 5s. per bush.; oats, 20s. to 21s. per qr.; beans, 21s. to 22s. per sack; flour with a good demand, 33s. to 33s. 6d. per 280lbs.—Feb. 24.

SUFFOLK AGRICULTURAL REPORT.

At the present changeable and dull season of the year there is but little in the agricultural operations of the county to call for comment. Corn generally may be a shade dearer, beef and mutton are both selling well, the turnips are much injured by frost, the mangel wurtzel partially rotting, and the labour of the farm progresses slowly. This is a summary of all that is literally important in the passing current events of prices, labour, &c., in the agriculture of the county; but in the agricultural political arena the scene is far more stirring Even Suffolk is aroused. The proposition of the Chancellor of the Exchequer to reduce materially the amount of duty upon the importation of wine and spirits, and yet leave the malt tax, with all its glaring injustice, untouched, has awakened the agricultural classes to political earnestness. At every market-hall, in market rooms, railway-carriages, and around the friendly board, the repeal of the malt tax has been the leading topic of earnest conversations. Farmers have again become conscious of a political existence, and they are aroused to the fact that it is for them, by a combined expression of opinion, to strengthen the hands of their representatives in the Commons House of Parliament—and the movement is general in every district in Suffolk—to make a powerful petitioning demonstration. Lavenham, Ipswich, Halesworth, and other farmer's clubs, have taken the lead, and we hear as from one voice the sentiment, though uttered by 1,000 tongues—"Unfetter English Agriculture! knock off her manacles! let her *be free! and then* encourage France and her farming if you will." Again.—"No Malt Tax! cheap beer for the poor man! *then* cheap wines for the rich if you will." Farmers, according to the Manchester school, are such dull people, such noodles, that they can't even comprehend that it is better for them to have cheap kid gloves, cheap wines, and cheap artificial flowers (which they don't use), instead of cheap beer, cheap tea, and cheap sugar (which they do). We hope the deep feeling of the county, and the agricultural community throughout the kingdom at large, will find an exponent of their sentiments during the present debate, and we look longingly for a notice upon the notice-paper of the House for a partial repeal of the malt-tax. Mr. Gladstone makes it appear that, because the rental return under schedule B has increased 19 per cent., such an increase is indicative of great prosperity on the part of the farmer. Can any argument be more fallacious? His income-tax is based not upon profits made, but upon rental paid; and hundreds of men this year will pay a heavy income-tax, not upon large profits, but with a serious deficit. Our friend Mechi (we respect him and esteem him—he is one of the best fellows under the sun—but we don't like to hear him make assertions which no number of men really believe in) asserts his profits have been nearly £700 per annum upon 170 acres of land, for the past six years. It would afford us much pleasure to see the entire accounts of Tiptree, from the payment of the purchase-money to the present time. We want, for the cause of agricultural progression, to have those accounts analyzed by three competent men, and it is our opinion they would reveal important facts, exciting landlords to judicious outlays, but warning tenants, as tenants, from following Mr. Mechi's example. We want to see Mechi's position as landlord and his position as tenant. We anxiously hope Mr. Mechi will consider our suggestion, and accede to it.—Feb. 24.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BALA FAIR.—There was but a very limited number of animals, but the demand of purchasers exceeded general expectations. Horses fetched from £30 to £40 per head. There was but a very thin supply of pigs, which were a shade lower. So also were the cattle, of which a very small number were exhibited, and mostly of inferior quality.

BARNSLEY FAIR.—There was a pretty fair show of horses, but fewer buyers than there have been on former occasions. Milch cows were in reasonable demand, and drapes very dear. There was a good show of store pigs.

BEVERLEY FAIR.—Good attendance of metropolitan and provincial dealers. Hunters, coach horses, and roadsters, of good quality, had ready sale at high prices, but inferior animals were a drug.

CARLISLE FAIR.—The number of draught horses shown was pretty large; business slack. There were a good many jobbers in attendance, but very few dealers, and many left the market without having effected a sale. Cart horses from £20 to £50, cart colts and fillies £18 to £30, ponies £7 to £17.

CHESTER FAIR.—In the cattle fair very little business doing, and prices about the same. Sheep and pigs scarce, and very dear. Of horses a large number were shown, but few first class ones were to be found. Business was not at all brisk, and long strings left unsold

CRIEFF ANNUAL MARKET.—The horses were numerous, but there was a large display of inferior and low-priced animals. The best draught horses sold from £35 to £40, and others at prices varying from £10 to £25. The market was remarkably dull. The show of cattle was limited. Few of the beasts could be called prime fat. The best beef brought about 9s. per Dutch stone, inferior 8s. Several lots of two-year-olds sold from £11 to £12 each. Milch cows were scarce, and chiefly aged animals. The best cows sold from £12 to £13, others were down to £7, according to quality.

DUNSTABLE FAIR.—There was a plentiful supply of stock; a good show of horses; small supply of sheep, and many pigs, with a large concourse of persons. Cows of best breeds, either down-calving or in full profit, kept their price, as did first-rate heifers and cow-calves for rearing. Best cows £20 to £22, second-rate £17 to £18, ordinary £13 to £14, heifers £12 to £14 each; store breeds, best 3 years old Devons, Herefords, and shorthorns £12 to £14, smaller Scotch, Welsh, and Irish from £7 to £8; calves 20s. to 40s.; best fat beasts 4s. 4d. to 4s. 8d., second quality 4s., fat calves 4s. 6d. to 4s. 8d. per 8lbs. Sheep were not so readily disposed of as at Leighton last fair, owing to the scantiness of sheep-feed. Best tegs and ewes were offered at 2s. each less money, and then all were not sold. Some few lots of couples were sold at a decline of full 3s. each. Fat sheep went freely at 4s. 8d. to 5s. per 8lbs. Dealers from London selected some best nag-horses, and those fit for draywork on the stones of the metropolis: best 4-years-old, warranted, 15 hands high, made from £30 to £40 each, smaller kinds from £25 to £30, cobs and ponies £15 to £20; best heavy Suffolk horses sold at from £30 to £40 each, others £20 to £30. A large supply of pigs, both fat and lean, for which sales were firm, at the top prices of other late fairs and markets.

EGREMONT HORSE FAIR.—There was but a moderate show, and only a few changed hands.

GLOUCESTER MONTHLY MARKET was well supplied with beef and mutton, and trade was brisk, while late rates were fully maintained. Beef sold readily at 7d., and mutton from 7½d. to 8d. per lb. Pigs were disposed of at from 9s. 6d. to 10s. per score.

LISKEARD FAIR was well supplied with cattle, but the sale was dull. Fat cattle sold at from 60s. to 65s.; store cattle at 40s. per cwt.; sheep from 7½d. to 8d. per lb.

PENRITH HORSE FAIR.—A large number of agricultural horses, as well as others of lighter draught. There were no crack, but some useful animals. Dealers were busy picking up anything likely, but the great majority were never asked a price. Horses which a few years since would have realized forty or fifty pounds, were at least ten pounds a head down. Draught horses, from £25 to £35. Hackneys were not so plentiful, and the prices of these did not vary so much as in the agricultural class. Not many of the very worst class were shown.

PENRITH PORK MARKET.—Carcases from 7s. to 7s. 6d. per stone.

RUTHIN FAIR.—The attendance of buyers was but thin, and consequently business was slow, and prices of cattle and sheep lower. Pigs sold briskly at high prices. The corn market was dull at prices as before.

SHEPTON MALLET MONTHLY MARKET.—The supply of animals was very good. They sold readily, late prices being well maintained.

TREGONY FAIR was well attended. Sheep sold at 7d. per lb. There was a plenty of good beef, which fetched £3 and £3 3s. per cwt. Several cows and calves sold at high prices.

WIGTON HORSE FAIR.—The show of horses was one of the largest ever known, and the attendance of buyers large. There was, however, a dull market; scarcely anything doing among low-priced animals, and only limited transactions among the higher classes, which were from £3 to £5 down.

WINSLOW FAIR.—Supply short. Cow kind good in quality, and made from £16 to £25 each. A fair supply of sheep, which were a ready sale. Pigs scarce.

WIRKSWORTH FAIR.—The supply of horned cattle was an increase upon last year's, although few sales were apparently effected. Store pigs a moderate supply, at somewhat advanced prices.

WORCESTER FAIR.—There was a very poor show of fat stock for the February fair. The attendance of buyers was small. Beef fetched from 6½d. to 7d. per lb.; mutton, 7½d. to 8d. Barrens were obtained at much lower terms. Pigs realized 10s. to 10s. 6d. per score; stores somewhat higher. Very little business done in the horse fair.

IRISH FAIRS.—Graigue: Beef, first quality, sold at 60s. per cwt., sinking offal; second quality from 50s. to 55s. per cwt. Springers from £12 to £16. The sheep fair was thinly supplied, the demand was good, and prices had an upward tendency, from 7d. to 7½d. per lb. Lambs sold freely at from 30s. to 34s. each. Fat pigs in good demand, at an advance of 2s. per cwt., pork bringing 52s. per cwt.; forward stores varying from 50s. to 60s. each; bonhams, average prices from 20s. to 25s. each.—Edgeworthstown was the smallest one for pigs for some time in this town, and prices very smart. Slips 20s. to 30s., stores 50s. to 70s. each; fat pigs 56s. to 60s. per cwt. in sink. Springer cows sold well at £10 to £15, store heifers £8 to £11, store bullocks £8 10s. to £10 10s., sheep for the knife 6d. to 6½d. per lb.; none of any other kind for sale. A very large supply of inferior horses, ranging from £8 to £15, with a good sprinkling of £18 to £25 horses; but the highest sold at £20 each.—Castledermot.—There was a large attendance of buyers, both in the horse and cattle departments. There was a fine show of horses, whose prices averaged from £30 to £60. There was a great demand for cavalry horses, which were purchased extensively for the 14th Light Dragoons. Fat cattle sold from £12 to £16 per head; springers from 10 to 15 guineas. Other descriptions sold in proportion. Fat sheep rated at from 40s. to 55s.; one fine lot of hoggets sold at 40s. per head. Fat pigs were in great demand, and sold at 55s. per cwt. The fair was excellent for prime stock of every description.

PRICES OF BUTTER, CHEESE, HAMS, &c.

BUTTER, per cwt.—	s.	s.
Friesland	124 to	126
Kiel	124	130
Dorset, new	126	130
Carlow	108	118
Waterford	108	118
Cork	108	120
Limerick	100	106
Sligo	104	116
Fresh, per doz. 12s. 0d. to 16s. 0d.		

CHEESE, per cwt.—	s.	s.
Cheshire	70 to	86
Cheddar	74	88
Double Gloucester	64	74
HAMS—		
York	80	86
Westmoreland	—	—
Irish, new	76	84
BACON: Wiltshire, dried	64	66
Irish, green	56	62

ENGLISH BUTTER MARKET.

LONDON, Monday, Feb. 27.—Our trade is very quiet all waiting to see the duty taken off.

Dorset, fine new	124s. to 126s.	per cwt.
Ditto middling	110s. to 112s.	„
Fresh	12s. to 16s.	per doz.

CORK BUTTER EXCHANGE, (Saturday last.) — The supplies are small, about 1,000 firkins having been received during the week. The Butter coming into market is bought up, and store Butter is still diminishing, but not freely, as, anticipating favourable accounts from Melbourne, the few holders are not pressing Butter on the market—expecting an advance for seconds, of which the stock at present consists. The price of 1sts and 2nds being nominal, was unaltered for the week; 3rds rose 2s. early in the week, but fell 4s. at the close; 4ths fell 8s. during the week; 5ths rose 2s., and 6ths 2s. This day's prices range from 72s. to 130s.

CHEESE MARKETS.

CHESTER.—There was a small fair, only about 60 tons being pitched. There was a good demand, and all sold at prices from 55s., 65s., 70s., to 78s.

GLASGOW.—The supply of cheese was small, and trade dull. There were only five tons passed the weigh-house scales, and five carts in the Bazaar. We continue quotations. Prime early-made, 63s. to 66s.; late-made and inferior, 54s. to 60s.; skim, 30s. to 32s. per cwt.

GLOUCESTER.—About 20 tons were offered for sale. Trade was brisk, and a clearance effected at the following rates:—Best thin, 65s.; seconds, 56s. to 58s.; skim, 40s. to 46s. per cwt.

LICHFIELD, (Wednesday last.)—A large business was done, and an advance of 10s. per cwt. was obtained.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, Monday, Feb. 27.—During the past week the arrivals coastwise have been light, but still equal to the demand. The trade keeps dull at last week's prices. The following are this day's quotations:—

York Regents	90s. to 100s.	per ton.
Lincolnshire ditto	80s. to 95s.	„
Dunbar ditto	100s. to 120s.	„
Do. Reds	85s. to 95s.	„
Perth, Forfar, Fifeshire Regents	75s. to 95s.	„
Ditto Rocks and Reds	70s. to 80s.	„
French whites	70s. to 80s.	„
Belgian ditto	60s. to 70s.	„

BOROUGH AND SPITALFIELDS.

LONDON, Monday, Feb. 27.—Coastwise and by railway the arrivals of potatoes since Monday last have been on a very moderate scale. The trade generally is firm, as follows:

York Regents	140s. to 150s.	per stone.
Ditto Flukes	140s. to 160s.	„
Lincolns	100s. to 120s.	„
Kent and Essex	90s. to 125s.	„
Scotch	90s. to 140s.	„
Ditto Cups	80s. to 95s.	„

COUNTRY POTATO MARKETS.—York, Feb. 18: Potatoes sell at 10d. per peck, and 3s. per bush. Leeds, Feb. 21: The show of potatoes sold at 12d. to 13d. wholesale, and 13d. to 14d. retail, per 21lbs. Richmond. Feb. 18: Potatoes 3s. 4d. per bush. Manchester, Feb. 21: Potatoes 8s. 6d. to 14s. 6d. per 252lbs.

REVIEW OF THE CORN TRADE

DURING THE PAST MONTH.

The past month has been very winter-like, after opening wet, so that but little field-work could be done. The unsown wheat lands have now but a poor chance this season; and the young wheat looks very backward, with a good deal of miss-plant. In some parts the early-sown pieces alone are said to be good, and in others to have suffered most. On the whole, the prospect of a large crop seems remote, and without very propitious weather next to impossible. The damage done to the root crops by the repeated and severe frosts has been very serious, and many lambs have been lost. The spring, therefore, opens rather darkly, with much wheat yet unsown; but, on the other hand, the heavy rains and snows since autumn have replenished the wells beyond what has been known for several years, and there is no longer any fear of drought for some time to come. The wheat trade, notwithstanding a great deal of injury to the newly-thrashed samples, has ruled firm; and as dry parcels have become more plentiful, they have gone off pretty readily, at fully 1s. per qr. more than during the past month. With a yet plentiful stock of good foreign and old English held by farmers, millers, notwithstanding a limited supply of dry parcels, have long kept reserved till necessity has made them more free in their purchases on favourable opportunities; and as March winds may be expected to improve the condition of the ricks, a better tone of trade seems highly probable. Still "the hope" of agriculturists "has been so long deferred" by the permanence of low prices, that many, losing heart, may cut away their chances just on the eve of realization; and it must be admitted that without some disaster, agricultural or political, a sudden or material rise seems distant. The shortness of feed has brought on a better demand for low-quality barley and linseed-cake, as well as given more firmness to beans and peas. The prospective adoption of the principle of free trade in France no longer exercises any influence in that country or here. There the wheat trade has lately been improving; and as the floods have done much damage in several departments, and the last crop was deficient, there is more likelihood of a further advance than a retrograde movement. Belgium, Holland, the Baltic ports, Switzerland, and the interior of Germany, as well as Italy, all show an upward tendency; while many parts of Spain and Portugal give quotations far above English prices, but the growing crops in these early countries are said to have a very favourable appearance. The Danubian ports have been dearer for wheat; Odessa has kept firm; and the United States, for their best wheat and flour, show great steadiness, with prices quite out of range for export. The late imports of flour all leave a loss, or are held at rates which prevent business.

The following quotations show the rates obtaining in foreign ports:—Fine wheat at Paris was worth 49s. The average price throughout France for the month of January was 43s. 2d., for the same month in England it was 43s. 11d., and our comparative prices now are much the same as then. The best Baltic at Antwerp was quoted 53s. per qr., and at Brussels 52s. The best Polish at Rotterdam was worth 54s. to 55s. per qr. Prices at Hambro' for red—Mecklenburg 49s. 6d., Wahren for spring 51s., and Holstein 63lbs. for spring 48s. per qr. free on board. A covering of snow has protected the autumn-sown wheat at Stettin, where 63lb. Pomeranian red was quoted at 47s. per qr. At Danzig prime high-mixed was worth 49s. to 52s. per qr. At Cologne, 48s. was made of the best quality. Stockholm quotations wers 40s. to 41s. Odessa, after slight fluctuations, for fine quality obtained 40s. to 42s. At Galatz, on the Danube, the best soft Wheat was quoted about 33s. per qr., the hard being all cleared at 36s. to 38s. 6d. per qr. Smyrna quotations for wheat were high, say, to 49s. 6d. per qr. Soft Berdianski at Genoa obtained 47s. per qr., hard 58s. 6d., Sardinian 53s. per qr. At Barcelona prices ranged from 65s. to 71s. per qr., at Seville 63s. to 76s. per qr. White wheat at New York, weighing 63lbs. per bush., was worth about 53s. per qr. free on board. Wheat at Sydney 58s. to 60s. per qr.

The first Monday in London opened on a very small foreign, and scarcely an average English, supply of wheat. Very little was exhibited during the morning on the Essex stands, but there was rather more on the Kentish. The portion that was dry and useful went off steadily at previous prices, but what was rough and damp was quite neglected, but these were gradually cleared as the week advanced, with a better tone in trade. The country markets this week had less wheat offering, and nearly all were firm or rather dearer. Norwich, Newcastle, Boston, Sleaford, St. Ives, and a few other markets were 1s. per qr. higher. Hull, Leeds, Manchester, and Bristol were rather against buyers. Liverpool both on Tuesday and Friday maintained fully former rates. On the second Monday there were only 65 qrs. foreign wheat, with below an average of home-growth. Kent and Essex again sent up but few samples; and as the condition was rather improved, this enabled factors to establish an advance of 1s. per qr. on all dry parcels, for which there was more demand, but those out of condition mostly remained unsold. The next market was a more lively one than for some time past, a good business in foreign, as well as English, being transacted at fully the previous rates, and occasionally rather more; but the last market was quiet. The country advices were quite in keeping with the London advices on Monday, every considerable place being 1s. per qr. dearer—as Birmingham, Manchester, Newcastle, Stockon-on-Tees, Norwich, Bristol, and Gloucester—though a return to frost had generally brought better suplies. Hull, Newbury, and some other places quoted a rise of 1s. to 2s. per qr. Liverpool, on Tuesday, made sales at 1d. to 2d. per cental advance, with large shipments to Dublin; the Friday's market being unaltered. The third Monday had for its foreign supply one solitary shipment from Danzig, which was made in the autumn, the English arrivals being about what is usual. The morning's contributions from Kent and Essex were on a very small scale. This being the day of the railway accident, a gloom was cast over the market, though fairly attended, and sales were only slow for good quality and condition at the advance of the previous Monday. The market in London continued steady to the week's close. In the country there was a general agreement as to firmness, Melton Mowbray and Wolverhampton being 1s. per qr. dearer; and Liverpool, on Tuesday, advanced 1d. to 2d. per cental on French red qualities. Flour also improved 6d. per sack. The fourth Monday was without foreign arrivals, and only an average supply of home-growth. The morning's show from Kent and Essex was small, and a great portion still in bad condition. For the few fine dry parcels rather more money was asked; but millers were not free buyers, and only the previous quotations could be obtained either for English or foreign qualities. The imports into London for the four weeks of February were 27,070 qrs. British wheat and 2,387 qrs. foreign—against 28,071 qrs. British and 22,407 qrs. foreign in February, 1859.

The flour trade, with very limited foreign supplies, has been generally heavy, country sorts being more plentiful than last month. On the second Monday, however, the improvement in wheat enabled factors to obtain 6d. to 1s. per sack more money, and this advance has since been maintained, leaving the prices for Norfolks 31s. per sack. Good American has been held at 27s. per brl.; fine French, being scarce, is worth 36s. per sack, which is not, however, over its value in Paris. Town-made qualities throughout the month have been unchanged, 43s. remaining the highest price. The imports into London for the month were 76,572 sacks English, with only 650 sacks 3,526 brls. foreign—against 74,501 sacks English and 9,788 sacks 1,224 brls. foreign in February, 1859.

The barley trade has been very steady, with values rather improved. English malting of fine quality has continued scarce in the London market, and as much as 51s. has been made for it in Suffolk. Good Scotch has been more plentiful; but though prices have ruled high, say 42s. to 45s. per qr., there has lately been less activity in the demand. The middling sorts have maintained their value, without being brisk. Low grinding sorts have attracted more attention, and have sold at fully 1s. per qr. more money, with very large transactions in the Danube for spring delivery, at from 13s. to 13s. 6d. per qr., free on board, at Ibraila. Holstein malting at Hambro' has sold at 32s. 6d., Saale to 38s. 6d., and Chevalier at 42s. per qr.; for Danish and Swedish 54 lb. per bush. 33s. has been paid, cost and freight included. Maltsters, towards the season's close, seem likely to be forced to use second-rate qualities, as Scotland is said to be nearly exhausted, and prices there have been advancing. The imports during the month have been 36,013 qrs. British and 24,058 qrs. foreign—against 16,554 qrs. British and 17,724 qrs. foreign this time last year.

The oat trade in the course of the month has been very quiet, the foreign arrivals being too insignificant to draw the attention of large dealers. White granary stocks hold out, it being rather their policy to reduce their own stores, and buy in again on gluts. Retail buyers have, however, found the market stealthily going against them, and on the second Monday there was a reported advance of 6d. per qr., which has since been rather exceeded. Should the frosty weather last longer than expected, and the Baltic supplies keep limited, there seems no doubt that prices will for a time be forced up, more especially as the near countries had bad crops, and Ireland maintains high prices. The imports into London for the four weeks were 17,850 qrs. English, 14,137 qrs. Scotch, 8,330 qrs. Irish, and 24,790 qrs. foreign—against 2,751 qrs. English, 20,714 qrs. Scotch, 6,306 qrs. Irish, and 28,697 qrs. foreign in February, 1859.

Beans, that were giving way nearly all through January, have partly recovered tone, with about 1s. regained in value out of the 2s. or 3s. then lost. This may partly be attributed to their improved condition, as respects new English samples, the small foreign imports, and probably deficient arrivals from Egypt. The want of cattle feed, too, has been felt, and increased their consumption this winter. The imports for the month have been 5,708 qrs. English, 704 qrs. foreign, against 6,224 qrs. English and 1,073 qrs. foreign in Feb. 1859.

Peas have scarcely varied. The consumption of boilers has been unusually limited, notwithstanding their low value—say, 42s. per qr. for fine breakers, while the quotation for such at Hambro' is 44s. Dun peas, being mostly soft, have only gone off slowly at former prices; but maples have sold more readily at fully the previous rates. The foreign imports have been scanty, and mostly white boilers. Stocks are getting low, and a few large contracts would certainly send up prices. The imports during the month into London were 2,217 qrs. English, 978 qrs. foreign, against 1,736 qrs. English and 629 qrs. foreign in February, 1859.

The supplies of linseed during the month have been short, and the exports good; still, there has been no decided advance, and only firm markets, the range of prices being above the average of former years; but linseed cakes, both home-made and foreign, have found an extremely animated demand on better terms—say, fully £1 per ton; these prices, though seemingly high, being low as compared with the artificial cattle feed, now so widely advertised, which, having in it some medical properties, will no doubt be beneficial as a change, but ultimately give place to simple real nutriment.

The cloverseed trade has met with a check in the wet and frosty weather. This has given more time to thrash out the low quality of English, which appearing too early for business, has been materially lessened in value, and made the sale of better qualities more difficult, unless holders would consent to some abatement. Few have been disposed to do this, prices being moderate. White foreign seed being without an English competition has maintained its high price, and as grazing has lately been more profitable than the culture of arable land, it seems likely that it will all through the season be dear. Trefoil, though dearer in France, has slackened both in demand and value here. Tares also have felt the influence of the unfavourable weather—former rates of 46s. for small and 64s. per qr. for large. Brunswick have been still maintained; but little has been doing. Canary-seed has been very dull, and scarcely holds its value. Rapeseed, hempseed, and the seeds used in confectionary have sold in retail at about former prices.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per	Quarter.
WHEAT, Essex and Kent, white, new 38 to 50 ....old	40 to	52
,, ,, red new 37 47 ....old	39	49
Norfolk, Linc., and Yorks., red....................	37	47
BARLEY, malting, new 30 to 36 .... Chevalier, new..	38	44
Grinding .... 25 26 .... Distilling	28	30
MALT, Essex, Norfolk, and Suffolk ... 49 to 57 .. fine	60	70
Kingston, Ware, and town made .. 49 57 .. ,,	60	70
Brown .... 48 49 ..	—	—
RYE ....new — — ..	30	31
OATS, English, feed ... 20 to 25 ...... Potato	26	30
Scotch, feed......... 21 26 ...... Potato	26	30
Irish, feed, white .... 20 to 23 .. fine	24	28
Ditto, black .... 20 23 .. ,,	—	25
BEANS, Mazagan........ 32 to 37 .... Ticks.........	34	36
Harrow.............. 34 42 .... Pigeon	45	48
PEAS, new, white, boilers 36 40 Maple 37 to 38 Grey	33	34
FLOUR, per sack of 280 lb., Town, Households 37s., fine	41	43
Country .... 31 to 32 ...... Households ..	32	36
Norfolk and Suffolk, ex-ship	30	31

FOREIGN GRAIN.

	Shillings per	Quarter.
WHEAT, Dantzic, mixed 50 to — high do. — to 52 extra	— to	55
Konigsberg .... 49 51 ,, — —	—	—
Rostock .... 51 — fine 54 old 54	—	—
American, white .. 43 49 red.... 42 to 47	—	—
Pomera., Meckbg., & Uckermrk, red 47 49	—	—
Silesian, red ...... 42 47 white........	46	50
Danish and Holstein	46	48
Russian, hard 44 to 46 .. French 40 to 47 .. white	44	48
St. Petersburg and Riga	42	47
Rhine and Belgium................................	44	50
BARLEY, grinding.............. 23 to 27 .. Distilling..	28	30
OATS, Dutch, brew, & Polands 22 27 .. Feed	19	23
Danish and Swedish, feed .. 21 24 .. Stralsund.	21	25
Russian	19	23
BEANS, Friesland and Holstein	34	38
Konigsberg.............. 32 to 36 .. Egyptian	33	35
PEAS, feeding .... 35 36 .. fine boilers..	37	38
INDIAN CORN, white ...... 31 34 .. yellow	30	33
FLOUR, per sack.... French 29 36 .. Spanish, none	—	—
American, per brl., sour.. 22 25 .. sweet	24	27

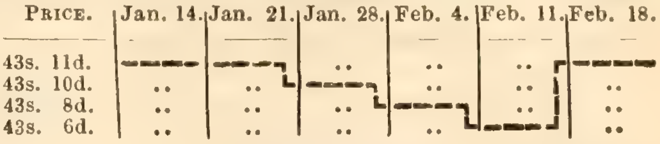
IMPERIAL AVERAGES.

For the last Six Weeks:	Wheat.		Barley.		Oats.		Rye.		Beans.		Peas.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Jan. 14, 1860	43	11	34	7	21	5	30	4	39	0	36	7
Jan. 21, 1860	43	11	34	4	21	1	32	1	38	3	36	2
Jan. 28, 1860	43	10	34	7	21	5	28	11	38	5	36	3
Feb. 4, 1860	43	8	34	10	21	0	31	0	38	1	35	4
Feb. 11, 1860	43	6	34	11	21	11	29	9	38	4	36	0
Feb. 18, 1860	43	11	34	11	21	11	31	10	38	6	36	3
Aggregate average .	43	9	34	8	21	5	31	4	38	5	36	1
Same time last year	41	2	33	5	22	0	31	5	40	7	41	9

COMPARATIVE AVERAGES—1860-59.

From last Friday's *Gaz.*		s.	d.	From *Gazette* of 1859.		s.	d.
Wheat......	117,309 qrs.	43	11	Wheat......	113,409 qrs.	40	10
Barley......	71,544 ..	34	11	Barley......	77,143 ..	32	11
Oats........	17,985 ..	21	11	Oats........	14,424 ..	23	1
Rye	55 ..	31	10	Rye	46 ..	32	11
Beans......	7,230 ..	38	6	Beans	7,157 ..	42	10
Peas........	1,581 ..	36	3	Peas........	1,340 ..	42	3

FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT.



PRICES OF SEEDS.

LONDON, Monday, Feb. 27.—The trade for seeds has been very quiet during the past week, with little business passing, and values were without change. This morning there was rather more inquiry, and values were without further reduction on red seed and Trefoils, and for white an advance of 2s. was obtained. Canary was without change.

Cutler & Barker, Seed Factors.

BRITISH SEEDS.

Mustardseed, per bush., new 10s. to 14s. brown	12s. to 16s.
Coriander, per cwt.	14s. 16s.
Canary, per qr..	50s. 54s.
Trefoil, new..	20s. 24s.
Tares, winter, new, per bushel	0s. to 0s. 0d.
Linseed, per qr., sowing —s. to 60s. crushing..	54s. to 58s.
Linseed Cakes, per ton................	£9 10s. to £10 10s.
Rapeseed, per qr,...................................	60s. to 64s.
Rape Cake, per ton	£5 10s. to £6 0s.

FOREIGN SEEDS, &c.

Cloverseed, red 48s. to 54s............. white	86s. to 94s.
Trefoil	20s. 23s.
Hempseed, small, —s. per qr. .... Dutch	—s. 40s.
Coriander, per cwt.	16s. 18s.
Carraway ,, ...	32s. —s.
Linseed, per qr., Baltic 52s. to 56s.....Bombay	58s. 60s.
Linseed Cake, per ton	£9 10s. to £11 0s.
Rapeseed, Dutch	58s. to 62s
Rape Cake, per ton	£5 0s. to £6 0s.

HOP MARKET.

LONDON, Monday, Feb. 27.—Our market continues affected by the proposed change in the duties, and the demand, which had been previously limited, has completely stopped. Prices remain nominally the same, as follows:—

Mid and East Kents	84s., 112s., 147s.
Weald of Kents	65s., 76s., 84s.
Sussex............................	65s., 74s., 80s.

Mease and Wild.

COVENT GARDEN MARKET.

LONDON, Saturday, Feb. 25.—Supplies of most things continue to be tolerably well kept up. Pine Apples and Grapes have not altered since our last report. Good Apples and Pears remain scarce. Oranges are plentiful and cheap. Good Cobs realize 1s. to 1s. 6d. per lb. Rhubarb, Asparagus, Seakale, Cabbages, Carrots, Parsnips, and Leeks are sufficient for the demand. Parsley is much cheaper than it has been. Cornish Broccoli, which is furnished by the crateful, fetches from 3s. to 4s. per dozen heads. Green Peas of foreign growth continue to make their appearance. Potatoes realize 4s. 6d. per bushel. Mushrooms can still be had in small quantities. Cucumbers are dear. Cut flowers chiefly consist of Orchids, Gardenias, Violets, Mignonette, Camellias, Azaleas, Heaths, and Roses.

FRUIT.

	s.	d.	s.	d.		s.	d.	s.	d.
Figs, per doz.	0	0 to	0	0	Pineapples, per lb.....	6	0 to	8	0
Apples, per doz.......	2	0	3	0	Currants, p. half sieve	0	0	0	0
Oranges per 100	6	0	10	0	Apricots, per dozen ..	0	0	0	0
Melons, each...........	2	0	4	0	Lemons, per 100	5	0	8	0
Cobnuts, per 100 lbs...	100	0	0	0	Plums, per punnet....	0	0	0	0
Mulberries, per lb.....	0	0	0	0	Pears, per dozen	6	0	8	6
Grapes, per lb..........	8	0	10	0	Pomegranates, each ...	0	4	0	0
Chesnuts, per peck....	0	0	0	0	Filberts, per 100 lbs...	50	0	60	

VEGETABLES.

	s.	d.	s.	d.		s.	d.	s.	d.
Broccoli, per doz.......	4	0 to	8	0	Beet, per dozen	1	6	2	0
Greens, p. doz. buncheas	4	6	6	0	Onions, per half-sieve..	1	0	1	6
Cabbages, per do........	2	0	3	0	Portugal, each	0	2	0	4
Seakale, per punnet....	2	0	3	0	Celery, per bundle......	1	6	2	0
French beans, per 100..	2	0	2	6	Shallots, per lb..........	0	6	0	8
Asparagus, per bundle .	7	0	10	0	Garlic, per lb............	0	6	0	8
Rhubarb, per bundle ..	2	0	3	0	Lettuce, cab., per score.	1	0	1	6
Potatoes, per ton	90	0	100	0	Tomatoes, per ½-sieve ..	0	0	0	0
Do. per bush.	3	0	4	6	Endive, per score	1	0	2	0
Do. per cwt.	6	0	8	0	Radishes, turnp, per doz.	0	0	0	0
Do. new, per lb.	0	0	0	0	Horseradish, per bundle	1	6	4	0
Green Peas, per quart..	0	0	0	0	Mushrooms, per pottle .	2	0	2	6
Carrots, per bunch	0	6	0	8	Parsley, per 12 bunches	4	0	8	0
Turnips, per bunch	0	5	0	7	Artichokes. per doz.....	2	0	3	0
Spinach, per sieve......	4	0	5	0	Marjoram, per bunch ..	0	0	0	0
Cucumbers, each	1	0	3	0	Savory, per bunch	0	2	0	4

CHICORY.

LONDON, SATURDAY, Feb. 25.—We have to report a dull inquiry for English and foreign Chicory, at barely last week's quotations.

ENGLISH, per ton	£10 0 to	£11 0	ANTWERP ...	£9 10 to	£10 10
HARLINGEN....	9 10	10 0	DACKUM	0 0	0 0
BRUGES	9 15	11 0	GUERNSEY....	9 10	10 0
HAMBURG......	9 10	10 0	BELGIUM	9 10	10 10

HAY MARKETS.

LONDON, SATURDAY, Feb. 25. — SMITHFIELD.—Trade steady at full prices.

CUMBERLAND.—A fair demand.

WHITECHAPEL.—Trade firm.

At per load of 36 Trusses.

	SMITHFIELD.	CUMBERLAND.	WHITECHAPEL.
MEADOW HAY ..	55s. to 88s.	60s. to 90s.	55s. to 88s.
CLOVER	80s. 105s.	80s. 105s.	80s. 105s.
STRAW............	26s. 30s.	28s. 32s.	26s. 30s.

TIMBER.

LONDON, SATURDAY, Feb. 25.—Owing to the proposed reduction in the duty, there is nothing doing in Timber. Prices, therefore, rule nominal.

Per load—	£ s.	£ s.
Quebec, red pine......	3 0 to	4 5
Yellow pine	3 12	3 15
Quebec Oak, White...	5 0	6 0
,, Birch..........	3 15	4 10
,, Elm............	3 12	5 0
Dantzic Oak	3 0	6 0
Memel Fir	3 10	4 5
Swedish	2 10	3 0
Nasts, Qubc. Red Pine	5 0	7 10
Do. Yellow Pine....	6 10	9 5
Lathwood, Dantzic fm.	6 0	8 0
Do. Memel	7 0	10 0
Do. Quebec	5 0	5 5
DEALS, per C. 12ft. by 3 by 9in.:		
Quebec Wh. Spruce	10 0	12 0
Do. Red Pine...	11 10	17 0
St. John Wh. Spruce.	11 11	15 0

Per load—	£ s.	£ s.
DEALS, Y. Pine, per reduced C.:		
Canada, 1st quality	16 0 to	17 0
Do. 2nd do.	10 0	10 10
Archangel Yellow..	10 0	15 10
Memel	13 0	15 10
Gothenburgh Yel...	12 0	12 10
Do. White..	10 0	10 10
Gefle Yel., 14 feet.	10 10	13 0
Christiania, per C.12ft. by 3 by 9in.:		
Yellow	14 0	15 10
White..............	14 0	15 0
Deck Plank, Dantzic, per 40 ft. by 3in. ..	1 0	1 6
Staves, per Standard M.:		
Quebec Pipe	65 0	70 0
Do. Puncheon ..	18 0	20 0
Baltic Crown Pipe.	160 0	220 0

BARK, &c.

	£ s.	£ s.
English, per ld. of 45 cwt. del. in London	17 0 to	21 0
Coppice	16 0	22 0
Dutch, per ton	6 0	7 0
Hambro'	6 0	7 0
Antwerp Tree	7 0	8 0
Do. Coppice	7 0	8 5
Mimosa, Chopped	8 0	9 0
Do. Ground	10 5	11 0
Do. Long	7 0	8 10

	£ s.	£ s.
Cork Tree, Barbary...	8 0	8 5
Do. Sardinian	11 0	11 15
Valonia, Smyrna, p.ton	15 0	17 0
Do. Camata	15 0	17 0
Do. Morea	10 0	12 0
Terra Japonica Gambier ...	16 5	16 10
Terra Japonica Cutch......	26 0	29 0
Divi Divi...............	9 0	11 0
Myrabolams	7 0	10 0
Sumach, Sicily, p.cwt.	0 14	0 15

WOOL MARKETS.

ENGLISH WOOL MARKETS.

LONDON, MONDAY, Feb. 27.—There is very little inquiry for any kind of home-grown Wool; nevertheless, holders, almost generally, are firm in their demands. To effect sales, however, lower rates must be submitted. The result of the approaching sales of colonial Wool, which will commence on Thursday next, is looked forward to with much interest.

Per sack of 240lbs.

Fleeces—Southdown Hogs............	£19 10 to	£20 0
Do. Half bred Hogs	19 0	19 10
Do. Kent..........................	18 0	18 10
Do. Southdown Ewes & Wethers	17 0	18 0
Do. Leicester do.	17 10	18 0
Sorts—Clothing, picklock............	19 0	20 0
Do. Prime and picklock..........	18 0	19 0
Do. Choice..........................	17 0	18 0
Do. Super	15 0	16 0
Do. Combing—Wethermatching ..	20 0	21 0
Do. Picklock	17 0	18 0
Do. Common	16 0	16 10
Do. Hog-matching	23 10	24 0
Do. Picklock matchig	18 10	19 10
Do. Super do.......................	16 0	16 10

BRADFORD WOOL MARKET, (Thursday last.)—More lookers during the past week, but the actual sales made are meagre in the extreme. Prices asked are about the same as last week; but more anxiety is evinced by the staplers to realize, before the droughty weather begins to take effect. In noils and shorts the demand keeps very steady, and prices are without change.—*Bradford Observer*

LIVERPOOL, SATURDAY, FEB. 27.

SCOTCH.—There still continues to be a limited demand for laid Highland Wool, the best qualities being the only kind saleable at late rates. White Highland is light in stock, and inquired for. Cheviots of a good class are still in demand, and command very full rates; inferior is neglected.

	s. d.	s. d.
Laid Highland Wool per 24lbs.....	11 0 to	13 0
White Highland do................	15 0	18 0
Laid Crossed do...unwashed ..	14 6	17 6
Do. do...washed	16 0	18 6
Laid Cheviot do...unwashed ..	17 0	20 0
Do. do...washed	19 6	26 0
White Cheviot do...washed	32 0	38 0

FOREIGN AND COLONIAL WOOL MARKET.

Per lb.		s. d.	s. d.
German, Saxon, and Prussian.	1st and 2nd Elect..............	3 4 to	4 6
	Prima	2 4	3 0
	Secunda	2 0	2 4
	Tertia........................	1 8	1 10
COLONIAL:—SYDNEY—	Lambs	1 10	2 1½
	Scoured do.	1 8	3 0
	Unwashed	1 1	1 3
	Locks and Pieces.............	1 0	1 10½
	Slipe and Skin	1 6	1 6½
PORT PHILIP—	Lambs..............	1 6	2 3
	Scoured do.	1 8	2 11½
	Unwashed	0 11	2 5½
	Locks and Pieces.............	1 5½	1 9½
S. AUSTRALIAN—	Lambs	1 10	2 1
	Scoured do.	1 1½	2 4½
	Unwashed	0 10	1 3
	Locks and Pieces.............	0 7	1 1
V. D. LAND—	Lambs	1 10½	2 3½
	Scoured do.	1 2	2 10½
	Unwashed	0 11½	1 5
	Locks and Pieces.............	1 3	1 7½
CAPE OF GOOD HOPE—	Fleeces........	1 2	2 4
	Lambs.........................	1 2½	2 3
	Scoured	0 9	2 7
	Unwashed	0 10	1 3½

BRESLAU WOOL REPORT, Feb. 23. — Our trade continues very brisk, with a great demand for all descriptions. Fine qualities are chiefly required, but already very scarce. Buyers, therefore, were obliged to satisfy themselves with the middling and lower kinds, from which they acquired about 2,500 cwts., the greater part being Russian and Polish fleeces, at from 65 to 75 thalers. A lot of fine Gallician one-shear realized 84 thalers, Silesian middle wool 85 thalers, and slipes 68 to 72 thalers per cwt. Buyers were Saxon combers, clothiers, and staplers, as well as many Austrian firms, who, in spite of the disadvantageous stand of the Austrian money, have been very eagerly purchasing. Fresh arrivals amounted to 1,800 cwts., and the total of our provisions is, at present, not beyond 13,000 cwt. Many contracts have been lately made for the future clipping, at an advance of 4 to 6 per cent. above last June fair quotations.—GUNSBURG, Wool-broker.

MANURES.

PRICES CURRENT OF GUANO, &c.

PERUVIAN GUANO (per ton, for 30 tons)......	£12 5 0 to	£12 10 0
Do. do. (under 30 tons)............	12 10 0	13 0 0

ARTIFICIAL MANURES, &c.

Nitrate Soda per ton	£15 10 0 to	£16 0 0
Sulphate of Ammonia..	14 0 0	14 10 0
Muriate of ditto	16 0 0	20 0 0
Corn Manure ..	6 10 0	7 0 0
Superphosph. of Lime....	5 0 0	5 10 0
Salt	0 19 0	1 5 0
Coprolite (gr'd)	2 12 6	2 15 0
Ditto (whole).	2 0 0	2 5 0
Estramadura Phosph. of Lime for 70 p. ct. p. ton	4 5 0	4 15 0

Gypsum	£1 5 0 to	£1 10 0
Bone Ash, for 70 per cent.	4 10 0	4 15 0
South American Bones..	4 15 0	5 0 0
London ditto, uncrushed ..	4 12 6	4 15 0
Do. ½-inch p. qr.	0 17 0	0 18 0
Do. dust	0 19 0	1 0 0
Animal Charcoal	4 5 0	4 10 0
Oil of Vitriol, concentrated, per lb. ..	0 0 1	0 0 0
Do. Brown	0 0 0¾	0 0 0

OIL-CAKES.

Linseed-cakes, per ton—		
Thin American, brls	£10 15 0	£11 5 0
Ditto bags	10 5 0	10 10 0
Marseilles.........	8 12 6	9 0 0
English...........	10 0 0	10 10 0

Rape-cakes....	£5 0 0 to	£5 10 0
Cottonseed Cakes—		
American decorticated..	8 2 6	8 5 0
Ditto, English	6 0 0	6 10 0

JOHN KEEN, Agent, 35, Leadenhall-street.

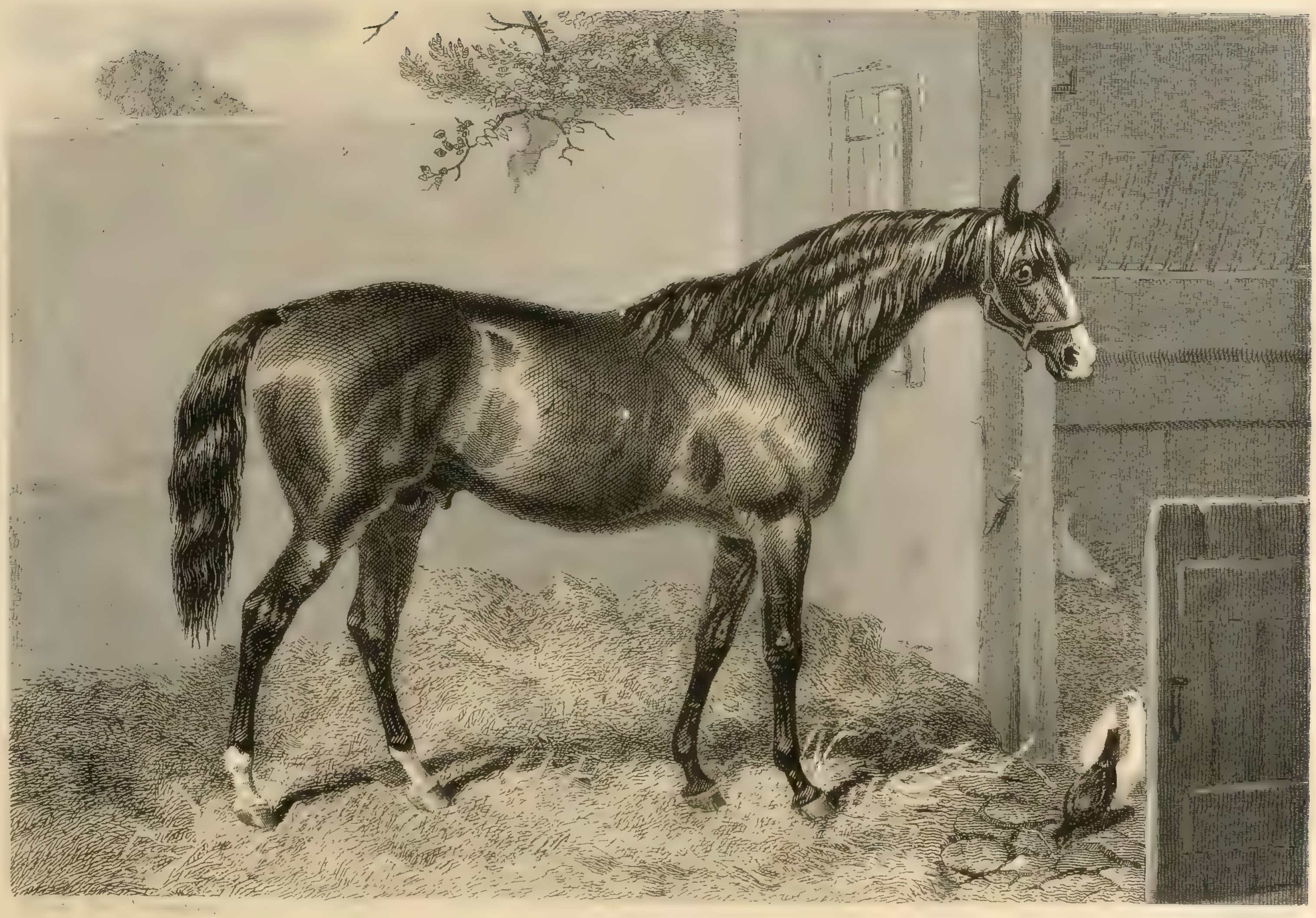
Agricultural Chemical Works, Stowmarket, Suffolk.

Prentice's Cereal Manure for Corn Crops	per ton	£8 10 0
Mangold Manure	,,	8 0 0
Prentice's Turnip Manure	,,	6 10 0
Prentice's Superphosphate of Lime.......................	,,	6 0 0

Manufactured by Hodgson and Simpson, Wakefield, and
Matthews and Co., Driffield, Yorkshire.

Nitro-Phosphate	per ton	£6 10 0
Ammonia-Phosphate	,,	8 0 0

Printed by Rogerson and Tuxford, 246, Strand, London.



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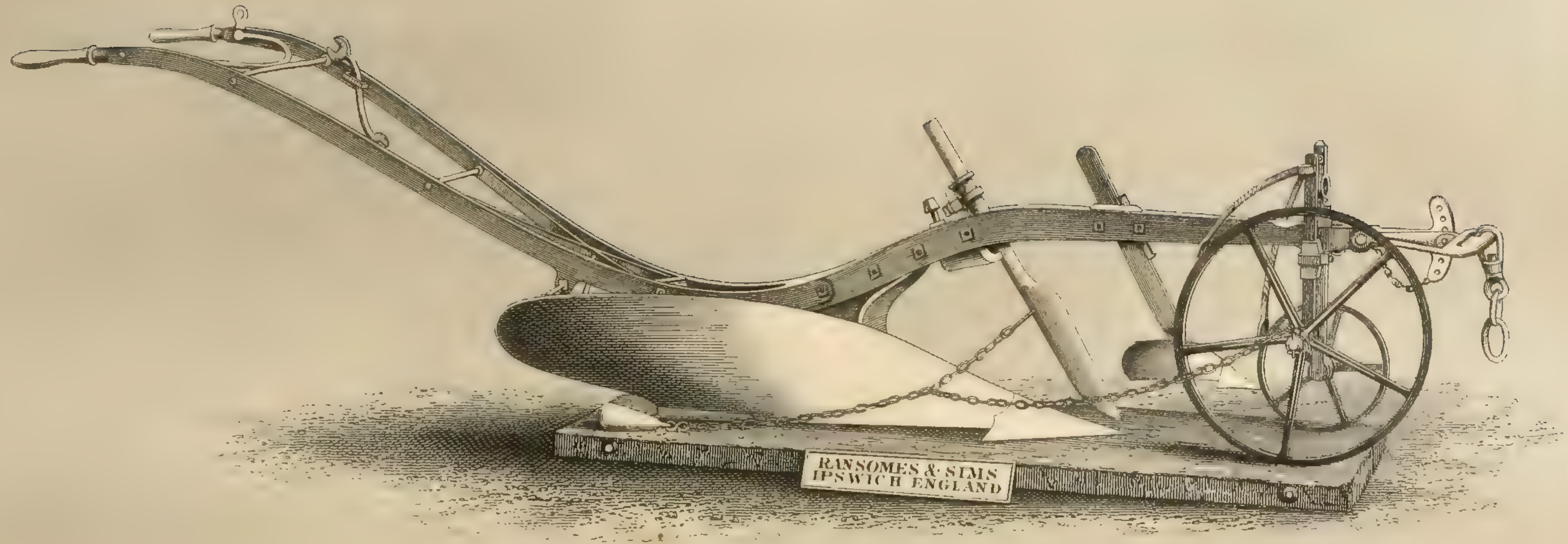
RANSOMES & SIMS
IPSWICH ENGLAND

THE FARMER'S MAGAZINE.

APRIL, 1860.

PLATE I.

LONGBOW; A THOROUGHBRED STALLION.

THE PROPERTY OF THE EARL OF DERBY.

Longbow, bred by Lord Derby in 1849, is by Ithuriel, out of Miss Bowe, by Catton, her dam—Tranby's dam—by Orville—Miss Grimstone, by Weasel—Ancaster—Damascus Arabian.

Ithuriel, also bred by Lord Derby in 1841, was by Touchstone, out of Verbena, by Velocipede. In the stud Ithuriel is better known as the sire of Iris, a winner of the Oaks, Acrobat, a first favourite for the Derby, Sir Rowland Trenchard, Dame Tattle, Cerito, Longbow, and many other winners. Lord Derby sold him to go to Russia in 1851.

Miss Bowe, bred by Mr. Townroe, in 1834, and purchased by Lord Derby when a three-year-old, is the dam of Antelope, William Tell, Bowstring, Archery, Strongbow, Crossbow, Iris, Longbow, Two Strings, Boiardo, De Clare, Target, Boomerang, Tom Bowline, and others. Some of these, such as Iris, Longbow, Boiardo, and De Clare, have been rather famous race-horses.

Longbow is a beautiful bright bay horse, standing sixteen hands high. He has a fine expressive head, with a capital eye, good crest and shoulder, and altogether is of wonderful length forward. He has an immense back and loins, muscular, but not over lengthy quarters, and he stands rather high from the hock to the ground. These are rather inclined to be curby, while his arms are good, but he is not large below the knee. Longbow is a very stylish, handsome horse; a little leggy perhaps, to look at, but showing an immense deal of breeding. He has the further recommendation of a famous temper and an excellent constitution. He was painted by Mr. Hall last summer at Knowsley, where his box stands in the centre of the Park—having Forshaw the stud groom's house at the back, and the mares' paddocks beautifully laid out and divided by stone-walls, as the prospect for the front.

Longbow's stock first came out, as two years old, in 1857, when he opened with two out of his three winners of such promise as Toxophilite and Longrange. Smut, Twang, Bopeep, Streamer, Medallion, and Sir Joseph Hawley's Venus filly, are further included amongst the winners accredited to Longbow, in his, so far, brief trial as a stallion. He stills stands at Knowsley at 15 sovs. a mare. Our list for the season will furnish further particulars.

PLATE II.

RANSOMES AND SIMS' PRIZE PLOUGH.

This series of Ploughs have received the following prizes from the Royal English and other Agricultural Societies:

The prize of £10 and Silver Medal, as the best heavy land plough—also to the same plough, a prize of £10 and Silver Medal as the best light land plough, at the Royal Agricultural Society's Meeting at Southampton.

Another prize of £10 at the Royal Agricultural Society's Meeting at Northampton.

The Council Medal of the Great Exhibition for this plough, as made by Busby.

The first prize at the meeting of the Royal Agricultural Society at Lewes, 1852—at Lincoln, 1854—and at the Carlisle Meeting, 1855—as the best plough for general purposes.

The divisional prize at the Bath and West of England Meeting at Tiverton, 1855.

The prize for deep ploughing at the Meeting of the Royal Agricultural Improvement Society of Ireland, at Carlow, in 1855.

The following is a description of the new plough as recently yet further perfected:—

The handles are of sufficient length to give perfect command over the ploughs, and the beam is on Ransome's patent trussed principle, by which greater rigidity and strength are secured, with the same weight of metal, than can be by an ordinary solid beam. This construction of the beam also permits the coulter to be placed quite centrally, so that it does not require to be necked, and therefore is more easily kept in its proper position than when it is necked, which it must always be in solid beam ploughs. The wheels are carried on one cross bar, the advantage of which is that they can be more firmly fixed in any desired position, and can be more quickly shifted than when they are carried on two separate bars. The whole wheel fastenings are rendered extremely simple, without omitting any adjustment than can possibly be required for either the land or furrow wheels. The draught is taken directly from the head, as the result of very careful experiments goes to show that in a properly constructed plough, the draught bar is quite needless and often very injurious, causing the plough to choke in foul land, or to pitch in hard land. The share is fixed to a wrought-iron moveable lever neck, which allows it to be set with more or less pitch, as may be required, and the arrangements for fixing the neck in the desired position are very much simplified and extremely effective. The form of the share and mould-board have resulted from a series of most careful experiments on a variety of soils, and they will be found to leave the furrow slice neatly turned over at an angle of 45°, leaving the upper edge full and sharp, so that there is the greatest quantity of land exposed to the weather that is possible with any given breadth and depth of furrow. The ploughs are very steady in work, and leave the furrow bottom clean and square. The skim coulter can be set with more or less pitch as desired, and particular care has been given to the form of its share and breast. From the simplicity and mechanical correctness of their construction, these ploughs are very light in draught, and will make excellent work, at the full depth for which each size is constructed.

Many thousands of the patent trussed beam ploughs have been made, and are now in general use. At the late trials at Warwick, they required lighter draught than any of the other prize ploughs; while the correct set of the ploughs was evidenced by the very superior work done by them when going without any one to hold them.

A portrait of Mr. James Allan Ransome, the head of the firm of Ransomes and Sims, appeared in the "Farmers' Magazine" for January, 1857. A portrait of Mr. Richard Hornsby, Senior, was given in January, 1858, and his Warwick plough in October, 1859. Mr. James Howard and the Bedford plough went out side by side in our number for January last, so that the three great Houses are now all fairly represented.

THE HERDS OF GREAT BRITAIN.

MR. AMBLER'S HERD.

Chap. XVI.

Crack Shorthorns seem to have the especial faculty of turning up in spots where one least expects them; and the Vale of Calder, with its almost unbroken succession of mills and factories, is hardly a Land of Promise. "The Grand Turk of the Evening," as Major Edwards styled Mr. Ambler, at the Portrait Presentation Dinner, has, however, wrought a wondrous change; and his friends and townsmen might well acknowledge it so gracefully as they did last summer. Cream and beef have learned to fraternize, under his auspices, with worsted and cotton; and the Herd Book has taken its stand with the ledger. Watkinson Hall Farm, about two miles from Halifax, on the Keighley-road, is the spot where this happy union was first proclaimed. It lies in Ovenden Vale, and is sheltered towards the north by Priestly Hill and Windy Bank, part of that backbone of the West Riding, on which the Ordnance sappers planted their theodolites in the days of the county survey. Mr. Ambler's holding is on the Halifax side of the valley, and consists of about 150 acres, running right down to his worsted mills. Only 20 acres of it is under tillage, and its not very stiff clay and marl is especially suited to swedes. The grass land is for the most part enclosed with stone walls, and snugly belted with oak, ash, beech, and sycamore, which almost hide from view the old Hall, where Thomas Dodds, his well-known bailiff, resides in the midst of his charges.

It is now about nineteen years since Mr. Ambler became a disciple of "Hoof and Horn." His first Herd Book entry was Captain Edwards (8929) by Captain Shafto (6833); but he did not fairly grapple with the thing till Culshaw came to him in 1845. Honeysuckle, the dam of Captain Edwards (so called after the present member for Beverley), at Lord Spencer's sale; Phyllis by Dan O'Connell, of Broughton renown, and her dam Abbess, bred by William Smith, of West Rasen; and Fanny Fairfax, from Mr. W. Holland, were among his first purchases. It was to the latter gentleman also, who had given 36gs. for him, as a calf, at Castle Howard, that he owed his Senator (8548). This renowned son of Lord Marlbro' (7166) won the local prize for aged bulls, at the York Royal in 1848, with Victor, the sire of Alice and Beauty, second; but he had to bow, along with Bates's Second Duke of Oxford (who had beaten Captain Shafto, the Northampton Royal winner, at Scarborough, the year before), and Maynard's Crusade, for the Royal prize in his class, to Deception, who subsequently proved to be only too truly named. Senator's turn was to come at the Exeter Royal, two summers later, where he wore the first prize ribbons, with the Wiseton-bred Weathercock (9815), and eighteen others behind him; but by that time next year he had been pitched overboard within four days' sail of New York. Sunrise, by Burlington (3245), (who was bought in three times at the Castle Howard sales) was another favourite of Mr. Ambler's; and Folly, of Whitaker's blood, Belle and her daughter Bell Flower, of Mr. Bates's; Marion of Lord Spencer's; Lady Morpeth and Jenny Lind, of the Fairfax tribe; and Panic, of Sir Charles Tempest's stock, were the chief herd matrons, when Dodds succeeded Culshaw in 1849.

With two such able heads to help him, Mr. Ambler might well take his stand very early in the day among the most successful breeders out. Although he has sent but few as yet to the Royal shows, he has won there five prizes for bulls, and two for females; and taking these into account, his sum total of prizes is 424, represented by £1,127 in hard cash, six cups, ten gold medals, and ninety silver ones.

The commencement of Dodd's career at Watkinson Hall was naturally marked with a leaning to the old blood, among which he had gained his experience at Farnley Hall, and he gave so good an account of them, that Gulnare by Norfolk, Medora of Booth blood, and Fair Frances by Sir Thomas Fairfax, all in-calf to Laudable, returned in his company from the Farnley draft sale in 1850. Two of their produce were Lord Byron, (11710) and Miss Frances, the latter of whom in the days of her greatest development, scaled a little beyond 200 st., and girthed nine feet two. She began well at Thirsk, with the first prize as a calf, and after being second at the Windsor Royal next year to Lord Hill's heifer she finished off with her twenty-third prize at the Birmingham Fat Show of 1853. At Smithfield, the week before, she had been just beaten for the head prize in her class, and the gold medal, by Mr. Phillips, of Wantage's heifer, as one of the judges thought her a trifle too strong in the hair, but the decision was "corrected" (as the saying goes) when they met again in Warwickshire. Mr. Ambler's feast of fat things did not end here, as his White Rosamond by Monarch (7249) (sister to the 1847-gold medal ox of Mr. Manning's, of Rothersthorpe, from whom he purchased her) put the seal to her Darlington Fat Cup victory, at Smithfield in 1855; and the memorandum below her picture is to the effect, that she was seven years old, and weighed 205 st., exclusive of loose fat, hide, and offal, when she was led out of Baker-street to the block.

Mr. Ambler's first sale was in 1852, and the catalogue embraced nearly a hundred animals, principally by Senator (8548) and Broker (9993) who had been purchased from Lord Ducie. Prices were low at the time, and no reaction was brought about by Mr. Strafford that day. Mr. Dugdale gave the last nod both for Miss Frances, and Gem, a daughter of Gulnare, at something beyond a hundred; but the former was bought back when she failed to breed, and "put up" to fatten forthwith. The same mishap befel Heirloom, which passed over to Mr. Ambler along with Bloom from the Killerby sale, as the nucleus of Herd No. 2. Bloom produced Dr. Buckingham (14405) by Hopewell, who departed after a sojourn at Mr. Cruickshanks's, for Old Kentucky; and the Duke of Richmond (7996) of the Bates blood, and Mr. Anthony Maynard's Crusade (7938) became the tenants of the bull-yard. The latter was only kept for five months, during which he was very extensively used, and then Baron Warlaby (7813) reigned in his stead. Mr. Ambler went still deeper into the Booth blood, by purchasing some Harbinger (10297) heifers, among a lot of females, from Mr. William Smith, of West Rasen, and lastly by the hire of King Arthur (13110) from Killerby. The celebrated Grand Turk (12969) and Britannia came as calves from Mr. Bolden's; and Lally, of the Bates blood, from Mr. Grundy's, Lady Colling, from Mr. Emerson's, of Eryholme, where Phœnix, the grandam of Comet (155), was bred, and Gilliver (11529) by Lord George (10439) from Bates's Blanche, were also among the fresh accessions.

Cowslip by Upstart (9760) was purchased from Mr. Tanqueray, in calf with Captain Balco (12546); but he left the herd at ten months old for Athelstaneford, where he did such yeoman service to Mr. Douglas. Grand Turk, however, atoned for his loss, and it is to this son of Grand Duke (10284) and Richard Booth's Young Rachel that Watkinson Hall owes its especial renown. He holds the post of honour over the sideboard in the dining-room, just above the Challenge Cups, which stand there in silver array, to tell of Yorkshire, Lancashire, and Cumberland triumphs. Master Butterfly (13311) vanquished him when they met at the Chelmsford Royal, but he was the only one that ever achieved it; and at Athlone, Rotherham, Durham County, and five or six more purely local shows he had no peer. He was three years and a-half old when he went to Chelmsford, and girthed eight feet eleven inches, just six inches more than his length from horn to tail; and perhaps, making every allowance for their difference in style, two nobler animals than himself and the Towneley crack have never met in a show-yard. It was hard to be second with such a bull, but Mr. Ambler had ample and timely consolation in the bull-calf class.

The second sale, in 1855, was a mere draft of heifers and young bulls; but such was the impetus which the fame of Grand Turk gave to the third and last in 1857, that its average (84 gs.) exceeded any of those *then* on record, with the exception of Lord Ducie's and Charles Colling's. Three heifers by him, Miss Nightingale, Lady Mary, and Western Lady averaged above 200 gs., and the two last named are now located the one in Kentucky and the other in Melbourne. His son Grand Master (14643), who appears in his master's portrait, was second to Mr. Challoner's Field Marshal, in a class of 132, at Dublin, in 1856, and first that summer in his class at Paris, where he found a ready purchaser for Sydney. Second Grand Turk (14645) from Cowslip was never exhibited, and went across the Atlantic as a yearling; and Lady Gulnare and Frances Fairfax also bore pledges of his love to the American pastures. The white Albion, whom the Americans talk of sending over, like a second Benicia Boy, to challenge all the aged bulls at Canterbury, was the produce of the latter; and about the time that his son Great Mogul (14651) was the hero of the Bushey Grove Ring, Grand Turk himself was shipped for Mr. Thorne, with 300 gs. on his head, and there he is to this day. The biddings for him were not lively, and very unlike those which took place that afternoon between Keir and Aylesby Manor, for the possession of Britannia. At last, victory declared for the Rose against the Thistle, but 270 gs. was the amount of the cheque which Mr. Torr drew. Mc'Turk (14872), in obedience to his name, passed into Mr. Stewart's hands for 135 gs.; and Museum (14968), a grandson of Baron Warlaby's, went for 160 gs. to Australia.

The Baron Warlaby blood has always thriven here. Napoleon, one of his sons, won the head bull-calf prize at the Chelmsford Royal, and was sold on the ground for 200 gs. to Mons. St. Marie, for the Emperor of the French; and his famous daughter Woodbine was bought by Mr. Ambler from her breeder, Mr. Dudding, of Panton. She was bought by an American breeder at the sale; but (as she was luckily due to calve the week before the ship started), on second thoughts, which were "best" for Mr. Ambler in this instance, they left her behind. Her half-sister, Princess Royal, was also bought back, and died in labour with Royal Turk. This young warrior composed, along with Woodbine and Lady Blanche, that celebrated Saxon trio which made such a successful descent on the Emerald Isle last spring. Eighty-two yearling bulls were drawn up in array against Royal Turk, but without avail, and he also received the silver medal as the second-best Bull in the yard, Lord Talbot de Malahide beating him with Priam, by Mr. Ambler's Comet (11298). Woodbine kept him in countenance with the head prize and gold medal for cows; and Lady Blanche was A 1 among 31 in the yearling heifer class. She then went to Warwick, and, coupled with Lady Florence, won a special prize, and Messrs. E. and N. Tooth, who had just bid 1200 gs. unsuccessfully for Royal Butterfly, bore her with her companion off to Sydney. Royal Turk did not return from Warwick, but was passed on to Mr. Langston, M.P., for 350 gs. He was entered for the Local Prize, which he won, as Mr. Ambler did not care to sully his Dublin honours by allowing him to compete with animals eight months his seniors; and preferred taking a second to Royal Butterfly with Prince Talleyrand, whose age more nearly approximated to that of the Towneley crack.

The herd at present numbers about 28 females and 14 males, besides some 15 or 16 half-bred dairy cows, kept partially to supply the work-people at the mills, which are situated some three or four fields from Mr. Ambler's own house at The Grange. These worsted mills are driven by engines of 100-horse power, and give employment to about 1000 work-people. The principal part of the wool consumed is grown in the southern counties, and Notts and Northumberland; and comparatively little is used of the long-fibred Lincolnshire. Laurel by Petrarch (5729), the dam of Leviathan, who was sold at a long price to Ireland, and her grand-daughter Lina, both of them bred by Mr. Fawkes, were in full occupation of Mr. Ambler's footpath as we approached. The old cow runs back into the Booth's Studley-Verbena blood, and though ten years have quite taken off her bloom, they have still spared her all the fine old character of the shorthorn. The red-and-white Venus by Baron Warlaby, dam by Royal Buck (10750), and so into Mr. R. Holmes of Ireland's Victoria tribe, was also there, and "good to tell" from her Booth style of head, and large middle rib; but the somewhat big hips contrast unfavourably with her remarkably nice offal. Here, too, was Alice of the Captain Shafto sort, inheriting his red colour, and, like many of his stock, compact, but slightly deficient in size. Laura, another of his daughters of the same type, and with a down horn, formed one of a lot of five, which were grazing among the Wiley-upon-Spofforth Leicesters in the Far Hill pasture behind the house. Near her stood Lady Laura, a stylish animal, with a remarkably nice forehand and delightful breast. She is by Crusade from Lady Collings, a daughter of Booth's Buckingham. A critic might have looked in vain for rough shoulder points, though perhaps he might have taken a trifling exception to her hips; but he must have been captious indeed to find fault with Rose Duchess, who is a combination of Maynard's Red Duke (13571), and Booth's Vanguard (10994). She is a long low cow, with a very sweet neck vein and open head, wonderfully level all over, and with her rich red colour, just the consort for the white Prince Talleyrand, to whom she has had a roan bull-calf, Royal Prince.

Acacia by Booth's Brideman (12493), from a Captain Shafto cow, was more remarkable for having had a calf before she was two years old, than for any very especial looks; and then a short walk to a field behind the Hall brought us into the very heart of the Captain Shafto family, which there mustered four strong. They were bought about two years ago from Mr. Henry Smith, of Drax Abbey, and all produced heifer calves. Niobe, the dam of Necklace, was a nice short-legged strawberry roan, rather strong in the head; and though perhaps neater altogether, she was rather less than her half-sister Calistra, a very nice cow both as regards hair and quality, and full of milking character about the neck. The same remark applies to Vivia of Booth blood, a compact cow with a remarkably good middle. Here, too, was Miss Milly, a grand-daughter of Mr. Fawkes's old Fairy Tale, and linked to antiquity by her crumpled horn. She is, moreover, somewhat patchy, and the first one in the herd on which we could at all fasten that soft impeachment. All her stock have gone out to Australia; and the Daisy cow chewing the cud beside her was bound for New Zealand as soon as she had calved. As she gives twenty-four quarts a day in the prime of her milking, the captain who takes her out gratis, on condition that provender is sent with her, does not make a very bad bargain.

The row of deserted pens which met our eye as we strolled from the pastures to the homestead, bore melancholy witness to the departed glories of the Cochin-Chinas, which once inspired the breast of Mr. Ambler, and scores of others, to such deeds of daring, round the auctioneer's table in town and country. No one was less chicken-hearted in the chicken-mart. There was a time when he and the late Lord Ducie, in their "noble rage," piled half-guinea upon half-guinea against each other at Covent-garden or Baker-street, and when neither of them scrupled to go to 30gs. for a hen. When the Earl died, Mr. Ambler was one of the most active bidders at the memorable Tortworth sale, as soon as Mr. Strafford quitted the society of the Duchesses, and stood, glass in hand, among the fowl-pens. Twenty-two guineas was the Watkinson Hall "closer" for a brood of Cochin chickens; and one of them alone brought back within an ace of that amount. Satisfied with his success, Mr. Ambler determined to get quietly out of them, "when the steam was up," and sold his sixty cocks and hens at all prices, from 5gs. to 18gs. a pen. Ten pens were parted with at Manchester, which, along with Doncaster and Birmingham, was a great exhibition-field with him; and the rest realized £177. Geese, too, were his fancy during the poultry mania; and his last pen—whose stag goose weighed 27lbs., or only 3lbs. less than the Birmingham Magog of 1860—realized 10gs. There are no traces of these glories now, save a few small gilt bas-relief cocks, which stand, like little crests, above the line of pens, facing into the yard. The insides are not exactly left to the owls and the bats, but serve as storehouses for swedes and mangels, while a few Dorkings keep them aired at one end, hard by the boar and bull stocks.

In a paddock by themselves, where the sale-ring is always staked out, was the thirteen-year-old Florence, by Rex (6385), and descended from Booth's Medora. She is a rare old cow, and by no means a brilliant ruin yet, but with a stamp of head and neck which look as if she had constitution enough to divide among a whole herd. Mr. Ambler owes her to Mr. Carr, of Settle, who bought her at the Rev. Thomas Cator of Skelbrook's sale. And thus, having worked off all the outsiders, we entered the homestead, which occupies four sides of a square, and is lighted by a large gas-lamp in the centre. On the west side, directly facing the range of bull-boxes, is the shippon, with its neat whitewashed walls, and calf-houses behind, which, from their peculiar shape and the pile of sawdust that was heaped in one, would remind us of winebins ready for stacking. Let us hope that the Prince Talleyrand vintage will prove as good as the Grand Turk one. The side adjoining the hen-roosts is entirely dedicated to pigs, who receive their nourishment either from within or without, through Torr's patent pig-troughs, and have their ventilation assisted by flues into the hen-roosts above. The breed has come principally from two Wiley sows, crossed with Old Joe of Towneley descent, some boars from Mr. Roper, of Keighley, and Balco from Mr. Mangel's, of Ripon. Master Brutus, and his son Rifleman, now seem the bacon monarchs of the yard; and their consorts, Plume and Georgie, lay stretched in repose on the midden, the latter representing in her person the undoubted dignity of the Pure Cumberland Browns. The liquid manure tank, large enough to rejoice the Mechian heart, is situated at the east end of the yard, and drains from the boxes, shippon, and piggeries run into it. A cold-water valve is connected with it for the purpose of dilution, when necessary, and the whole is drawn off by another valve, and carried through pipes on to the adjacent meadows, which do ample credit to their iron fertilizers.

The other two sides of the yard, which is paved with flags set edgeways, were devoted, one to the bulls, and the other to the cows and heifers; and the projecting ledge of the roofs serves both to protect their attendants from the wet and to ward off the fierce heat in summer. Four bulls'-heads thrust forth simultaneously over the half-doors in honour of Necklace saluted us, as she was turned out of her box for inspection. She is by Booth's War Eagle from Niobe, and the winner of six prizes, two of which were gained as a pair with Cassandra. At first sight, the latter is the wealthier of the two, and her great middle, good crops and hair, and graceful horn, impress you more; but, on examination, she is not so level and true as her companion. The blue roan Woodbine, and her worthy daughter Wood Rose by Heart of Oak (14683), a son of Grand Turk, were next in waiting. The former, from Westeria, by the Duke of York (6947), is only five years old this month, and has won about 18 prizes. She is as level as a die till you come to her hips, which are not quite in keeping with the rest. Her quality is very nice, and her back seems to tremble like a sea to the touch, as you lay your hand on it. Wood Rose is more of a red roan, with a neat open head, and thicker-fleshed than her dam. The next pair that came out were Ringlet by Lord of the Valley (14837) from Rose Duchess, which inherits the eternal dewlap peculiar to so many of his stock, along with a nice breast, and in this case rather a high rump. In the latter point, as well as the hair and handling, the roan Vine by Hindoo (14707) from Vivia had the advantage of her; and Water Queen—she of the twisted horn, and the winner of nine prizes when only in store condition—struck us especially for her peculiarly well-sprung rib and fine room for breeding. If "Milk" were substituted for "Water" in her name, it would describe her talents to a nicety.

Frederick's Lad (16081) a son of Towneley Frederick and from Vestris 2nd, was the first of the bulls which came on to parade. He has great size, a fine forehand, and generally well turned frame, but is somewhat plainish behind. The forehand and shoulder points of Eclipse (15976) by Fugleman (14581) were not very pleasing; and Viscount Warlaby (17194) by Majestic (13279), a son of Crown Prince, struck us as a lengthy and rather narrow bull, with a good flank and top, but still rather wanting time. He was bred by Mr. Carr, but the cream of the Settle pastures came out fourth in the shape of the beautiful hero of 12 prizes, Prince Talleyrand (16765). He is by Prince of Warlaby, and all Booth with the exception of one Gainford cross. During the time which had elapsed since Warwick, he had not been idle either in growth or service, and he looked quite in show trim, after serving some thirty-three cows and heifers, with Thorley's Mixture as an occasional tonic. It is difficult to find a bull with a sweeter look, and of more perfect proportions, save and except a slight deficiency of breast. His first calf Portfolio from Actress was one of two residents in the calf-house, and struck us as being remarkably rich in its hair, and deep in its flank; while Woodbine's somewhat odd-coloured calf, West Australian, had a very bloodlike-head, but a tendency to be a little plain about the rump. Then came Florence's twins, Prince Alfred (16721) and Prince Arthur (16723), the latter of which had just been sold to the Duke of Richmond. Since then Prince Alfred has changed his settlement to Mr. Carne's, of Churchill Heath, near Chipping Norton. One of them takes after its dam, and the other after Lord of the Valley, in colour; but the cross had not exactly hit, owing to the cow being too long for him, and there was a lack of strength in both their middles. Royal Oak (16780) by Heart of Oak (16193) from Alice had great maturity for a ten months calf, with good hair, colour, and touch to boot, and nicely packed in the quarter, but hardly all we should have hoped for behind the shoulders. In substance he beat Great Eastern by Milton (16568) from Water Queen, and the winner of three prizes, but the latter had quite the best of him with his snug neck vein, and sweet head and muzzle. With him our Yorkshire shorthorn inspection for the present ended, and in another fortnight we were within sight of the bay where his great iron namesake had been lying, and then wended our way inland for a preliminary view of the colossal herd at Broadhinton.

H. H. D.

[In answer to many enquiries, we may state that we propose to act strictly up to the title of our papers, and extend them in due course to Herefords, Devons, and the other established breeds of cattle.]

THE DRY AND THE WATER-DRILL.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

The advantage which is derived by the application of small proportions of liquid to the soil is but little known. The same remark, indeed, might be extended to the use of water to the soil in general. And yet there are several well-known facts which might excite our attention, and induce us to institute very useful experiments—trials not fraught with much labour, or attended with risk, or outlay of money.

The remarkable fertilizing effect of adding small proportions of water to the soil with the seed has chiefly been noticed by the growers of roots. Here the soil, from the nature of our cultivation, is usually very deficient in moisture. Our summer fallows—the results of repeated ploughings, scarifyings, and exposure to the sun and the winds—very frequently render our turnip lands much drier than is desirable. To remedy in some measure this over-dryness of our root-soils, several plans have been suggested. Autumn-cleansing has been adopted—the water-drill has been successfully employed on by far the greatest number of soils, especially on the eastern and driest side of our island; and its use will probably be much extended as its advantages are better understood.

It certainly contrasts, in its mode of depositing the seed, very favourably with the dry drill; for although both may alike have to drill the seed into a too-well dried soil, yet their action is diametrically opposite. The dry drill usually deposits its seed mixed with some powdered manure, such as superphosphate of lime, and ashes, which are still drier than the soil; a dry mass which in many cases must have a tendency to keep the moisture of the soil from reaching the seed. The water-drill, on the contrary, leaves its liquid-manure, enveloping the seed, and protected by the soil from the drying action of the sun and winds.

The small proportion of water which has been sometimes successfully employed in this way is remarkable. This fact is alluded to by Mr. A. S. Ruston, of Aylesby, near Chatteris, in a recent valuable paper on the water-drill (*Jour. Roy. Ag. Soc.*, vol. xx., p. 369). He uses Chandler's water-drill; and, when speaking of his mode of drilling, tells us that when sowing mangold, colseed, or turnips, he invariably uses only two coulters, which, with a four-feet six-inches drill, makes the rows just twenty-seven inches apart; careful and close observation during the last five years having thoroughly convinced him that this distance is in every respect better for either of these crops than three coulters eighteen inches apart would be. The horse-hoe can be used freely and frequently, and a stronger and more vigorous plant secured.

When sowing any crop where only two coulters are employed, Mr. Ruston uses plates in the cistern for the discharge of the liquid, with holes punctured through them from one-half to five-eighths of an inch in diameter; and with these a cistern full of water, of about sixty gallons, sows forty chains, which gives a total of about 220 gallons, or only about one ton of water per acre. With larger-sized holes an increased quantity of liquid could easily be sown; "but experience," adds Mr. Ruston, "does not prove that this would generally be of practical advantage."

This, however, is an important question by no means decided. It would be well if to different plots of the same field various proportions of water were added, and the produce of each ascertained. The practice of those who in other countries have long and most successfully employed liquid-manure for their root-crops leads to the conclusion, that in suitable places for obtaining a supply, a much larger amount of water than that adopted at Chatteris might be profitably used.

Take, for instance, the quantity of mixed water and urine, so profitably applied to his rye-grass, from an ordinary road watering-cart, by Mr. Dickenson on the Middlesex clay soils; or think of the ten hogsheads per acre of liquid manure applied to their rye and wheat soils by the Belgian farmers, equal to more than two-and-a-half tons per acre (*Jour. Roy. Ag. Soc.*, vol. iii., p. 242); facts hardly reconcilable with the opinion that one ton of water per acre, mixed with any manure, gives the maximum amount of advantage for root crops.

The *mode* in which the water applied by the drill operates so advantageously to the crop is, I take, either—1st, by supplying the young plants with moisture; or, 2nd, by dissolving and diffusing in the soil the soluble portion of the manure with which it is drilled, and thus rendering it more readily absorbable by the plant; or, 3rd, the water may be advantageous in both ways.

There is no doubt but that all manures are absorbed by the roots of plants in a liquid form. It is, then, evidently of importance to unite these fertilizers with the moisture of the soil as soon as they are applied to the land; and this the water-drill does very effectually. It is true that the ton of water drilled per acre may be soon reduced in amount by evaporation after it is drilled; but still one important object is attained—the salt is dissolved in the moisture of the soil, and probably remains in solution in spite of the evaporation produced by the action of the sun and winds; for it is rarely, if ever, that the driest soils under ordinary circumstances retain less than ten per cent. of their weight of water.

It would seem that it is to this view of the case that Mr. A. S. Ruston inclined when he observed (*ibid*, vol. xx., p. 377)—"Why it is that such marvellous results, on some soils especially, should accompany the use of the water-drill and superphosphate of lime, belongs rather to the chemist than the practical farmer to explain. It appears pretty certain, however, that the action of the water upon the soluble portions of the manure is such that healthy food is made immediately available to the plant, whilst the less easily soluble portions are slowly and gradually decomposing in the soil, yielding the support required by the plant as it continues to progress, and, as the experiments show, not failing it until its full growth has been attained. I have also further learned from experience that the manure sown in this liquid form is not only beneficial and influential upon the early growth of plants when applied to lands where drought or a deficiency of moisture prevails, but also upon lands which are in a satisfactory condition as regards moisture. On one or two occasions I sowed lands with coleseed which were too wet to roll, and when the horses had to be taken out in consequence; and yet the difference between the crops where the manure was sown with the water-drill and where applied with the dry drill was as apparent and as marked as in any other cases where the lands were in a totally opposite condition. One would scarcely have expected this. The general supposition would have been that the moisture contained in the soil would have exerted the same influence upon the more easily soluble portions of the manure as did the water applied to it in the cistern of the drill, and that therefore the crop would have been equally vigorous and healthy where the manure was sown dry as where sown in a liquid form. But the result proved otherwise."

But if we regard merely the value of the ton of water per acre added to the soil, it is far more considerable than at the first sight appears; for if we suppose that the water is drilled at a distance of 27 inches, and that there are 92 rows of 70 yards in length per acre, and if we calculate that the water delivered from each coulter moistens an extent of the soil equal in breadth to three inches, then this moistening of the soil extends to only about 536 square yards of soil, or at the rate of between nine and ten tons per acre, which if it fell in rain would be a good soaking shower equal to about 1-10th of an inch, but which, from falling on the surface of the field, would assuredly be far less advantageous to the young plant than the same amount deposited under the surface immediately in contact with the germinating seeds; or, to put the same thing in another way, as the water drill moistens *in breadth* (if we calculate its diffusion of water at 3 inches and the drills at 27 inches apart), one-ninth of the land then drilling in one ton of water is equal to nine tons moistening the whole acre.

The inventor of the water drill seems to incline to both modes of explaining its good action on the root crop; for in a recent communication from Mr. Chandler, dated at Aldbourne, March 6th, 1860, he remarks, in reference to the theory of its action, "I have no exact data to guide me as to the *quantity* of water best suited for the production of the different crops to which liquid may be applied; but my own experience has led me to observe that for turnips or brassica crops (which are those I have principally experimented upon) the amount of water required depends much upon the weather and time of year. We commence by sowing rape about the middle of April. It often happens at this early season that there are frosty nights, which take a very injurious effect on seeds put in with liquid, especially when a too liberal supply of that is given. As a rule therefore, we put on as small a quantity as will properly diffuse the manure. When the temperature is higher we lay on a considerable quantity more—even should the land be ever so well saturated with rain.

"Strange as this statement may appear, not only my own observations, but that of most others who have used the drill, will corroborate it.

"Warm moist seasons are those when the beneficial results of the water drill are most apparent. I quite agree in the opinion that the advantages of applying the bone manure liquidized is by supplying the young plants with moisture, and by dissolving and diffusing the soluble portion of the manure *evenly* over the soil. The latter point more particularly calls for remark, as on that, in my opinion, rests the chief merit of my drill. The manure being so minutely and thoroughly mixed with the water by the action of the buckets or stirrers, the soluble portions must be distributed in the drills exactly in the proportion of the water; and of this I am pretty well certain, that when the soluble salts come in contact with other elements in the soil, they are rendered doubly productive as food for the young plants, and give them a further supply in their more advanced stages. I cannot better illustrate this portion of the subject than by comparing the food of infants and of the turnip plant in its very infancy. It would be the height of folly to attempt to make the former eat a crust. It must, of course, be prepared to meet the requirements of its several functions. It is no less absurd to think that a turnip plant just vegetated should have the power of availing itself of the food contained in a crude bone—both, when properly prepared, are nutritious: our pap-dish is the cistern of the water drill."

It is noticeable, when we are considering the value of the *water* drilled with the manure, that in the earliest reported trials with superphosphate of lime for turnips, this salt was successfully mixed with a considerable portion of water.

In 1843, in the report of the Morayshire Farmers' Club (*Jour. Roy. Ag. Soc.*, vol. iv. p. 165), the experiments made in 1842 by Mr. M. William, of Sherriffstone, are given.

It will be seen by the three following comparative trials of this excellent Scotch farmer, with the common turnips, that the produce per acre increased with the quantity of water mixed with the superphosphate, or up to 3½ tons per acre.

MANURE.		PRODUCE.	
Bones	20 bush.	12 tons	4 cwts.
Bones Sulphuric acid Water	20 bush. 76 lbs. 126 lbs.	13 „	0 „
Bones Sulphuric acid Water applied in 640 gallons of water in the furrows.	4 bush. 16 lbs. 224 lbs.	17 „	4 „

In the same early report is recorded the trials of Mr. Geddes, of Orbliston. The manure employed and the results obtained per acre may be thus briefly abridged — here, again, about 3½ tons of water per acre were drilled:—

MANURE.		PRODUCE.	
Bones	12 bush.	11 tons.	9 cwts.
Bones Manure	15 bush. 15 loads.	13 „	19 „
Bone-dust Acid Water These applied, mixed with 660 gallons of water	1 bush. 67½ lbs. 201 lbs.	13 „	10 „

In the following year the experiments of the Duke of Richmond were made. He applied per acre—(*Jour. Roy. Ag. Soc.*, vol. v. p. 444)—only about two tons of water.

MANURE.		PRODUCE.	
Bones Sulphuric acid	8 bush. 83 lbs.	11 tons.	0 cwts.
Bones	16 bush.	11 „	0 „
Bones Sulphuric acid Water	2 bush. 83 lbs. 400 galls.	12 „	4 „

In the year 1843 the trials of Mr. John Hannam were attended with similar results—but with double the proportion of water used by the Duke of Richmond—(*Jour. Roy. Ag. Soc.* vol. v. p. 460). In these cases the produce per acre was as follow:

MANURE.		PRODUCE.	
The soil simple		7 tons.	0 cwts.
Bone-dust, 16 bushels drilled with the seed		15 „	3 „
Bone-dust Sulphuric acid Water these applied, mixed with 840 gallons of water	8 bush. 168 lbs. 604 lbs.	17 „	9 „
Bone-dust Muriatic acid Water applied, mixed with 840 gallons of water	8 bush. 168 lbs. 604 lbs.	17 „	7 „
This last trial repeated, with only 84 lbs. of sulphuric acid		13 „	7 „

The effect of using only a ton of water per acre for mangolds has recently been reported by Mr. A. S. Ruston. The following table gives an abridged statement of the results per acre in the season of 1854. The seeds were drilled in April; the roots weighed in October; the amount of water per acre about one ton :—

Drill.	Manure	Manure.	roduce.	
			tons.	cwt.
Water drill	1½ cwt. Lawes' superphosphate of lime	16 loads	20	16
Dry drill .	Ditto	16 loads	15	9
Dry drill .	None	16 loads	13	13
Water drill	1½ cwt. Lawes' superphosphate of lime	16 loads	20	19
Dry drill .	Ditto	16 loads	15	16
Dry drill .	None	16 loads	15	0
Water drill	1 cwt. Lawes' superphosphate of lime	11 loads	17	7
Dry drill .	Ditto	11 loads	13	15
Dry drill .	None	11 loads	8	15
Water drill	1¼ cwt. Lawes' superphosphate of lime	11 loads	15	14
Dry drill .	Ditto	11 loads	14	14
Dry drill .	None	11 loads	11	17
Water drill	1 cwt. Lawes' superphosphate of lime	13 loads	13	19
Dry drill .	Ditto	13 loads	10	8
Dry drill .	None	13 loads	6	18
Water drill	1½ cwt. Lawes' superphosphate of lime	15 loads	9	18
Dry drill .	Ditto	15 loads	8	12
Dry drill .	None	15 loads	6	10
Water drill	1 cwt. Lawes' superphosphate of lime	13 loads	27	14

It is not, however, every soil or situation that is adapted to the use of the water-drill; but then the exceptions are probably not very numerous. Some soils may, as in the instance given by Mr. Ruston, form a kind of concrete with the water. On other lands water may not be attainble; but still there are very many farms where water is sufficiently near to the surface to be profitably obtained. Its application too does not involve nearly so much labour and expense as we might reasonably anticipate. The evidence of a practical farmer, on this head, who has for years extensively used a water-drill, is very satisfactory. Mr. Ruston tells us (*ibid* vol. xx. p. 366.)

"The mode of working these drills is far less difficult than would be generally conceived. The main thing is the supply of water required, and, upon an occasional farm, this does grow into a slight difficulty. On our fen-farms, where every field is surrounded by ditches, which throughout the entire year have a supply of water, this difficulty has no existence. And upon what we technically term our *high* land farms, where hedges generally prevail, we have either open ponds and reservoirs, or pumps supplied by unfailing springs, where ample supplies of water can be procured. In cases like these we find it necessary to purchase either some old oil casks, or, what is better, because stronger and more durable, some old sherry butts. These we fit up with a sort of hopper at the top, where the water is cast into them, and a leather hose at the end, where the water is discharged; this hose being made sufficiently long to admit of its being hung by a loop upon one end upon the top of the cask, when no discharge is required, by which means any improper escape of the water is avoided. These casks are placed in an ordinary dung-cart, and, to prevent any rolling motion, a little long soiled straw is placed on either side of them. This simple and inexpensive method, where proper water-casks, for other uses, are not required, answers every practical purpose. It very seldom happens that more than *two* of these casks are required to keep a drill fully at work. These will serve for distance exceding half-a-mile, and three would convey the full quantity of water required if the distance exceeded a mile. Where two only are required to be used one horse is ample; where three are needed two horses will be necessary. One cart containing the full cask may always be set down in the field where the drill is working, being careful to place it in such a position that it will not interrupt the drill in its work, but will, at the same time, be convenient for use. The hose is unfastened from the top of the cask, and that end of it is placed in the cistern of the drill, allowing the water to continue to run until a sufficient quantity has been obtained, when the hose is again fastened as before. Where water is procured from the ditches which surround the field in which surround the field in which the drill is at work, the method adopted is very simple indeed. A large tub is placed at the side of the ditch just where the drill turns out at the end; this tub is kept filled with water, the drill draws up by the side of it, and the men at once, with pails, fill the cistern."

The oat crop has not been tried with the water-drill to any great extent; what has been done, however, in this way, may well prompt us to institute extended and more accurate trials. We are all aware how much the oat plant delights in a moist season; and how poor a return in a dry climate it makes for the application of the best artificial manures. So that we might reasonably expect that the use of a considerable portion of water would be attended with valuable results. Here, again, we have the evidence of Mr. Ruston. He tells us—(*Ibid*, vol. xx. p. 375.).

"During the last two years I have sown all my oats with the water-drill. Where these crops have been sown upon land where coleseed had just been eaten, and which was in thoroughly good condition, I have applied 2 cwt. per acre of Lawes' superphosphate of lime. In one or two instances, where the oats were sown upon wheat stubbles, I have this year applied 1 cwt. of Peruvian guano and 1 cwt. of superphosphate, properly mixed, per acre. The results have been eminently satisfactory; and, had I contemplated writing this paper, I would have made some careful experiments to show the precise amount of benefit derived by this crop from the use of the water-drill. But although I have failed to do this, I can nevertheless record my convictions, arrived at by a most vigilant attention to the crops whilst growing, and to their appearance at the time of harvest. With the oat crop my experiments were somewhat different from those made with the green crops, my object being rather to ascertain the amount of benefit to be derived from the use of superphosphate applied in a liquid form by the water-drill, than to test the comparative merits of the two drills. I therefore in every field—as near the middle of it as I could—left one width of the drill without any manure. These six rows I continued to notice at different intervals throughout the whole of the summer. When they first came up only a slight difference was perceptible; but as they commenced growing the difference became more distinct, until they reached the 'weaning time,' when those without manure assumed a weak and sickly appearance, whilst the others were scarcely checked in their growth, and where the land was free from wire-worms made rapid and surprising progress, which made the unhealthiness of the six rows increasingly visible. For my own information, and to aid me in deciding upon my future course with reference to the growth of oats, I attempted at harvest to estimate the difference in the produce of the crop, which I placed at three quarters per acre in two or three different cases. My readers will be prepared, therefore, to receive the statement that it is my intention to continue the use of the water-drill and superphosphate for this crop. I may here remark that three of these fields of 14 acres, 16 acres, and 20 acres respectively, were lands which, previously to the introduction of the water-drill, would scarcely grow oats at all, and consequently they were seldom or never sown. On two or three different occasions when I had made the attempt a crop of five quarters per acre was the result; whereas this year, with the water-drill, I believe I have, in two out of the three fields just named, from eight to nine quarters per acre. These fields consist of a light and rather dusty soil, with the gravel near the surface, and in dry seasons grow a very small bulk of straw. The water-drill meets this difficulty. On these soils it has enabled me to change my rotation, and to adopt a five-course shift of coleseed, oats, wheat, seeds, wheat; whereas formerly, I could only grow wheat after the coleseed, and was consequently driven to fallow every four years upon land which did not otherwise need it, and was also subjected to the inconvenience and loss occcasioned by being compelled to eat off all my coleseed before the end of October—wheat on these soils universally failing if sown later.

"I now grow my coleseed and oat crops on these lands exclusively with the water-drill and artificial manure, reserving the whole of the farm-yard manure for the wheat crops, and the system appears to succeed well. I should observe that in feeding off these coleseeds I always give the sheep either linseed or cotton-seed cake, or some kind of corn."

Mr. Ruston combats very successfully the argument sometimes advanced, that the use of the water mixed with the superphosphate merely stimulated the growth of the young plant *in its early stages*, but not afterwards. He adds—

"When the water-drill was first introduced, and its influence upon the early growth of green crops was recognized, it was thought and said by many, that this excessive growth would not be continued, but that the manure would soon become exhausted; and that the plant, when approaching maturity, and most in need of sustenance and support, would fall short of nourishment, and evince symptoms of premature decline and decay. But in my own experience these theories, prompted by fear and founded upon mere surmise, have not in any one instance been confirmed by fact. A reference to the foregoing table will clearly show that the rapid progress made in the early growth of the crops was fully maintained to the end.

Upon the whole then, we can hardly, I think, avoid the conclusion, that the use of water mixed with manure, either by the drill, or by applying it in a ruder form, in the furrows, as is the custom in some continental places, is well worthy of far greater attention than it has hitherto received. The progress which the water-drill is making, seems to cheer us on in this inquiry. It is hardly more than twelve years since the first implement of this kind was produced, and already they are not unfrequently met with in most agricultural districts. We are, perhaps, rather too willing to regard the water to be met with on or near to our farm as less available than it is really the case. In this instance, some of the Belgian, German, and Swiss farmers have evidently been more attentive; and even in the New World, long before the days of Columbus, the Peruvian cultivators were used to mix a small porportion of guano with the water with which they fertilized their thirsty soils.

DAIRY MANAGEMENT GENERALLY IN NORTH WILTS.

A paper on this subject was recently read at the Crown Hotel, Faringdon, by Mr. E. Little, of Lanhill, Chippenham, Wilts. The chair was taken by Sir R. G. Throgmorton, Bart. Mr. Little said:

It is with the greatest diffidence I appear here to offer you any remarks on the dairy management of North Wilts, for I feel assured there are many persons present, members of your club, much more capable of introducing this subject than myself. For many years past I have not had any practical experience in the management of a dairy, my farms being chiefly devoted to sheep-breeding and the rearing of young cattle. I am, therefore, labouring under considerable disadvantage in not being enabled to speak of this matter from my own present experience; still I have an extensive knowledge of the farms of the district, and frequent opportunities of seeing the different systems pursued, and, from inquiries and observation, I am enabled to lay before you a short statement of the system and management pursued in the dairy farms of North Wilts. I propose to give you a plain, practical statement of the general system, without reference to any particular farms; and as there has, within the last few years, been new methods of cheese-making introduced, I propose to refer to those, but I cannot pretend to offer you any scientific address on the art of cheese-making. My observations will, therefore, refer chiefly to the management of the pastures; the description of stock, with their selection and treatment; and the methods of making cheese, and its subsequent management. This latter part you probably will consider the most important, concerning which I am the least able to speak with confidence. Should I fail to offer you anything either instructive or interesting, I trust you will excuse me, and "accept the will for the deed."

The pasture and meadow lands of North Wilts, if not from "time immemorial," have from the earliest date from which I have been enabled to gain any information of the agriculture of the country, been principally devoted to dairy purposes; and as late as 1811, when Mr. Davis wrote his report on the farming of Wiltshire, it would appear little or nothing was done to renovate or improve the pasture lands of the district. Feeding and mowing alternately, and feeding the hay out on the part mown, were considered sufficient to keep it in condition for dairy purposes, at that date. The richest meadows in the Vale of Avon and other favoured spots were then used for grazing. At the present time there are very few farms, even of the best land, upon which grazing is carried on exclusively. Draining at that period was but little understood, and less practised, the surface of the land only being kept dry by open trenches.

Considerable improvements have, within the last few years, been made in the grass lands of the district, and (although there has not been that great change wrought on the dairy farms of Wilts as there has been in another large cheese-making country—viz., that of Cheshire) much has been done to improve the poorer pastures of the district of which I am speaking by draining and manuring, but still much remains to be done; for it is well known to us all that the pasture lands—not only of Wilts, but throughout the whole country—do not receive the same attention as the arable land, although it would be equally grateful, and prove quite as remunerative to the occupiers, if not more so. It is true that yard manure is made in larger quantities, and more carefully preserved, and with the admixture of ditch-scouring, road-earth, &c., the pastures certainly get a greater share of dressing than formerly. There is very little done in manuring with bones, guano, or other artificial manures. I have known, in some few instances, the "grass manure," manufactured by Messrs. Proctor, of Bristol, tried with success;* but to dress grass land with artificial manure, is an expense the North Wilts farmers do not, at present, feel inclined to incur to any extent, without a surer guarantee of a profitable return than they have at present. What manure is used, is, for the most part, laid on in the winter months; the plan of manuring after the scythe is little practised, although, no doubt, it is the best time of year to manure pasture land; but it is considered to cause a loss of feed, which at the time can be ill spared, although a subsequent advantage would be gained. There are two systems pursued in feeding the pastures by many, and I believe, in the majority of cases, the alternate system of feeding and mowing is adopted. There are some farms where, from the situation of the fields, it cannot be conveniently done, and the same "cow-lease" is fed every year, and the manure laid on the lands that are mown; the former system is undoubtedly to be preferred where it can be pursued. In the important branch of husbandry, that of haymaking, the North Wilts dairy farmers, in my opinion, stand pre-eminent; great attention is paid to the quality, as well as quantity, by early mowing and great attention to the making. There is no district with which I am acquainted where so much good hay is usually made as in this district; and it is quite requisite it should be so, as it is the only food for the stock to depend on in the winter months. On many farms there is not sufficient arable land, to provide either straw or roots, to any extent, to assist in keeping the cows through the winter.

The herds of cows of the North Wilts dairies are now generally of the short-horned breed; *i. e.*, in most dairies that breed predominates; but there are a great variety. There are to be seen in some of our best dairy-farms as fine herds of cows as can be found in any county of England; though not, however, with their "names, colours, and ages enrolled in 'Coates's Herd Book,'" they have, possibly, as many good combined qualities, and, as dairy cows, prove much more profitable to their owners than their most aristocratic sisters. Comparatively speaking, very few breed the stock for their dairy; some farms rear sufficient for their own use, and there is some very excellent short-horned stock bred in the county. The world-wide name of Richard Stratton at once suggests itself, and there are many others who breed some very good stock; but it is not, by any means, considered a breeding district.

Many of the first-class dairymen select their cattle with great care and at considerable trouble and expense. In making their selection, the milking qualities are the first point attended to; but there are other points that influence the purchaser in his selection—symmetry, aptitude to fatten when no longer a dairy cow, and with some the colour has considerable weight in the choice; and when all the good qualities are combined, then price is not so much an object, as many sales of heifers, both by auction and at market, will amply testify. Very long prices are now given for really good animals. There are, of course, in such a large and varied district, many farms where neither breed nor colour is much attended to, their milking qualities and their making useful grazers being the chief requisite. Consequently, on such farms there are a great variety, and description, and non-description of breeds; for where the stock is not bred on the farm, it is not likely there would be a similarity of character, shape, &c. As before stated, the majority of the dairy-farmers purchase the whole of their stock; they are usually bought in at three years old, with their first calf. Large supplies are brought from Gloucestershire, Oxfordshire, Buckinhamshire, and other distant counties—even from Northamptonshire, Lincolnshire, and Leicestershire, the dealers bringing them in large droves to the several markets and fairs in the months of February, March, and April. Those persons who are more particular in their choice frequently forestall the places of sale, by making long journeys to meet the droves to obtain an early selection, and frequently all the best heifers are bought up before arriving at their destination, and unless the trade be bad it is seldom now that we see any of the best heifers pitched for sale in the markets.

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* See Mr. Sotheron Estcourt's report to the Chippenham Agricultural Society, of experiments with different manures on grass lands, 1857.

In the early part of the season the dairymen prefer buying their heifers a short time before calving, so as to get them home and rest a few days before they drop their calves; further on in the season they like to have them with their calves, or as near to calving as possible, and one is often surprised to see the difference there is made in the price of heifers just about to "come into pail," and technically termed "good sellers," and those of equal quality a week or two later to calve, and perhaps not quite so good in colour, or with some other slight defect (and many of our dairymen are very capricious), though eventually the latter animals may prove more profitable. For some reason or other, the dairymen seem to prefer purchasing of the dealers rather than of the breeders; I suppose it is from their being able to select just as they please from the droves of the former; and the dealers, knowing the prejudices of their customers, take care to "lay it on pretty thick" when they have something tempting to offer.

In the best part of the district it is customary to have the cows commence dropping their calves at Christmas, or soon after, and, if possible, to have them all "into work" by the 1st of April; but where the land is not so good and early, a month or two later than that is preferred. A few of the earliest calves are fattened, on most dairies, if the demand for weanling calves has not commenced, and there is not sufficient milk to begin cheese-making.

There is a great demand for good well-bred heifer calves for weaning from the occupiers of mixed farms in the adjoining districts, where there is not sufficient pasture, or inclination on the part of the occupier, to keep a dairy.

The calves are reared and kept till three years old, and then find their way back to the dairies wish their first calf.

The dealers, too, who supply the stock of heifers, now frequently provide a well-bred bull, and contract for all the heifer calves, at good prices, and in some good stock the bulls also; but generally the latter go into other counties as sucklers; which is the case with all the calves now sold for weaning.

After cheese-making once begins, they are sold at ten days or a fortnight old, and sometimes younger; all the milk goes to the cheese tub. In some of the larger dairies the making of cheese scarcely ceases throughout the year: the late calved cows are milked on till the early ones come into pail.

Cows are not now kept in the dairies so long as in the days of the old "long-horns;" they are seldom kept beyond six or seven years of age.

It is now the custom to have a few of the oldest cows every year in season earlier (say November or December), and sold for the London market.

The cows that calve early are generally let dry about six weeks or two months before calving; those that are later are generally dry a longer time, and kept on the roughest portion of the hay; or they are sometimes sent to the arable farm, to straw for a few weeks; but that I believe to be often done at a loss to their owners; the animals lose their flesh, and do not give the quantity of milk the following summer; but if three or four pounds of cake per day is allowed, *then* there is no harm in the plan; but without that it would be better to keep them at home, and provide straw and roots, or cake, as is now usually done where there is sufficient arable land for that purpose.

Great improvements have been made of late years in the building of yard accommodation for the dairy cows; we do not see so many wintered in the field; *still* there is much room for further improvement in this way. The cows, when expected to calve, are brought home to the yards, or some dry pasture near the homestead, that they may have the best keep and constant supervision of the master or the cowman.

The best hay the farm produce is always kept for the cows after they are in milk. The older cows are (*or should be*) kept apart from the heifers, in order that they may not injure the young ones; and the latter be enabled to get a fair share of food, which they will not do if kept together.

It is not at all usual to tie cows up to feed them. They are generally fed in upstand cribs, or in cribs under the walls of the yard; and here I would remark, that often considerable waste of hay is made, by the master cow driving the under ones from crib to crib, dropping a mouthful of hay every time; to prevent this, I have seen a coarse rack (similar to a rail-hurdle) thrown upon the hay. The cows are then unable to pull out the hay so easily.

The practice of tying up the cows to be milked, both before they are turned to grass and during the summer, is now very frequently adopted, and I think must be attended with the best results; it is far preferable to the milkers running about the yards, when wet and full of muck, more particularly in hot weather, when the flies are constantly teasing them. There is also this advantage: the milkers cannot pick and choose their cows—the old hands leaving the hardest milkers for the young ones, which is frequently the case when loose in the yard; but when tied up, they begin at one end of the stall, and follow on in rotation till all are done. I have lately seen the names of the cows printed on zinc slides and fixed on the heads of the animals (as in a hunting stable), every cow being tied up in her appointed place to be milked morning and night.

There is no operation in farming that requires the attention of the master more than milking—to see that the cows are all properly milked clean; if that be not done, the cow soon loses her milk. There is an old saying, that "the last half-pint is worth the first pint." Milking is done both by men and women, and the in-door servants—or, at any rate, the dairy-maid—is generally expected to take a share in the work. Seven or eight cows are generally found sufficient for each, so as to have the milk in the dairy of sufficient temperature to "run" without requiring to heat any.

The hours of milking are about five in the morning and four in the afternoon, when cheese is made twice a-day; and in the height of summer it begins a little earlier in the morning. The number of cows kept of course varies with the size of the farms--from seven to eight cows to ten times that number, and some dairies consist of more than one hundred cows. Cheese is not often made where fewer than the first-named numbers are kept. About three acres is considered sufficient for a cow, but some of the richest meadows carry more than that quantity, and the less fertile farms require a greater quantity of land to keep a cow throughout the year; but, from improvement in the land and winter arrangement, there is more stock kept than formerly on the same quantity of land.

The farm houses of the North Wilts district are, for the most part, conveniently situated for dairy purposes. They are often found in the centre of the pasture land, or, when situated in the village, the yards usually open into one or more of the pastures, so that the cow may always be driven home to be milked, except when feeding in some of the fields, in the autumn, that have been mown, and are situated at a distance from the homestead: *then* it is sometimes found to be more convenient to milk in the fields, and bring the milk home in carts.

Much attention is given to the situation of the dairy. A north aspect is mostly selected, in order that the sun may have as little effect upon it as possible; and often if a little more care were bestowed upon the ventilation and drainage it would be as well. There is one objection often to be seen in the North Wilts dairies: the piggeries are placed too near the house; no doubt so placed for convenience in taking off the whey; but often found to be a considerable nuisance. Cleanliness, of course, is the great desideratum in all good dairy-work. Nothing tends more to the deterioration of the cheese than a tainted atmosphere and unclean vessels. A good supply of water is therefore necessary, and that is provided either by means of pumps, or pipes and taps. The latter is preferred when it can be conveniently adopted. I think the dairy-women of North Wilts may take credit to themselves for this most essential point both in the house and the vessels used. There are several descriptions of tubs or cowls used for receiving the milk: some are made of brass, others of tin, and many of oak; but the latter are fast giving way to the two former. The oak milking pails are also giving way to tin buckets. Lever presses have entirely superseded the old box presses. Leads are always used for whey, and barrel churns turned either by hand or horse power, according to the size of the dairy, are used for churning the butter.

This leads me to the most important point of our subject—the making of cheese. The North Wilts cheese has long contested celebrity with Cheshire, Cheddar, Stilton, and other descriptions made in England; and I think I may say, without fear of contradiction, that at the present time there is more attention given to the details of cheese making than at any former period; and the introduction of the new inventions, of which I shall have occasion to speak, being based more upon scientific principles, than what may now be termed the "old system," I trust will tend to keep up the character of the North Wiltshire cheese amongst the other esteemed varieties.

The management of this branch of husbandry devolves principally upon the mistress or daughters of the family, assisted by one or more dairy-maids, according to the size of the dairy; but for my own part, I do not see why it should not be performed by men as well as women, if it is reduced to a system (as it is said to be), by the newly-introduced methods; and by a regular use of the thermometer, and the clock, men may surely undertake the work. I know of one or two instances where the work is done by men, and very excellent cheese and butter are made by them.

In the large dairies cheese is made twice a-day in the summer months, when the number of cows kept does not exceed thirty. It is not frequently made more than once a-day, except, perhaps, during a few weeks in hot weather. It is usual to set up a small portion of the milk to make butter, even when cheese is made twice a-day, and in some dairies this is carried to too great an extent for the quality of the cheese: the usual quantity of milk butter does not often exceed one pound per cow per week. The milk, after the cream is taken from it, is used for warming the new milk to a proper temperature for running, *i. e.* when the rennet is added. I will now proceed to describe the method that has for many years been pursued in Wiltshire dairies with success, though I fear many excellent managers differ slightly in the details that I shall mention, as I know many persons pursue some favourite plan, considered by themselves to be an improvement; but my observations have been principally collected from some very good dairy-women in the district, whose cheese for many years has obtained the best market price.

As the milk is brought from the cows, it is put into the cheese-tub (a large cloth being thrown over the tub), and the milk passes through a fine hair-sieve, placed in a ladder or frame, fixed across the tub to prevent any dirt or hairs passing through. It is difficult to say at what temperature the rennet is added, for in very few instances is the thermometer used: all is done by "rule of thumb;" the heat is judged by inserting the hand, and experienced dairy-maids will be tolerably correct in their judgment. The state of the circulation of the blood, and the difference in the state of health of the individual, must of course tend to cause a variation; about eighty-five degrees is generally aimed at, but this varies with the quality of the soil and the season of the year; the richer the soil, the lower the temperature; and in the spring and the fall of the year, it is requisite to raise it a few degrees higher. The proper temperature is obtained by warming the milk, that has previously been skimmed (care is taken not to heat any portion above 120 degrees); when this is done, the rennet and colouring matter are added, and stirred gently through the milk. Nearly all Wiltshire cheese is coloured, and the fluid extract of annatto, manufactured by Mr. W. Nicholls of Chippenham, is now almost universally used for that purpose. It has obtained the approbation of both factors and dairymen, (and I may mention, as a proof of its approval, that Mr. Nicholls had a substantial testimonial presented to him some time last year, for his perseverance in the successful production of an article so essential for colouring cheese.)

The time allowed for coagulation is about an hour; and when that is complete, the curd is cut across with long knives, reaching to the bottom of the tub, and the "breaking up" is carefully managed by the use of a small stirring stick (similar to a brewer's washing oar in miniature); the spars, either of stout brass wire or galvanized iron, being put to the bottom of the tub, and raised gradually through the curd; this is continued till all is broken fine. At this stage of the proceedings an important operation is required, on which the quality of the cheese much depends, viz., that of adding the "scald," that is, a quantity of whey, heated to about ninety-five degrees. Some parties add it in the "slip," as it is technically termed, or when the curd is smooth and soft, and before it is settled down; and by others, it is added when the curd has settled and become firm. This latter plan is generally adopted in the dairies of the richer parts of the district; and the former where land is not so good. After the scald is added, it is stirred well together for ten minutes, and then allowed to settle at the bottom of the tub. The whey is then lifted out in wood or tin bowls, and poured into the leads, passing through a fine sieve, which keeps back any small particles of curd that may be taken out with the whey. When the whey is all dipped off, the curd is then scoured with a knife in various directions, and placed in a heap on one side of the tub. It is cut and turned over, and heaped two or three times, to allow the whey to drain off more completely. To facilitate this, the tub is raised a little on one side. The curd is pressed either with the hands or by means of a board with a weight to press out the whey that remains. A cloth is generally placed over the curd, for the sake of cleanliness.

When sufficiently dry, the curd is again cut into pieces, salted at the rate of about a pound and-a-half of salt to the cwt., this varying with the thickness of the cheese intended to be made.

It is then put through the mill and broken very fine into the vats; a cloth is put into each vat, and the curd pressed down by the hands; the vats are filled above the edges to allow for compression. When the vats are all filled they are placed in the press for about an hour or so; the cheeses are then taken out and another cloth wrung out of warm water or whey put on them, and the cheeses returned to the press.

This is repeated with dry cloths once or twice, and any edges that may protrude over the vats are pared off. In twenty-four hours after making, the cheese is rubbed with salt on both sides, and this process is repeated again on the three following days for thick cheese—twice is considered sufficient for thin cheese. On the fourth or fifth day the cheeses are placed in the vat without any cloth; a little salt is rubbed over to prevent its sticking to the vat; some use unbleached calico to make the outside smooth.

They are turned in the vat every morning to the seventh or eighth day, or till they are worked through the press in use, when they are taken to the cheese-room or loft, and spread singly on the floor or on shelves placed on stands erected in the room, when they are turned every day for the first fortnight or so, and after that they are turned over twice or three times a week.

The cheese-room, which is generally over the dairy, is kept dry and well ventilated; when in such case, and with good management, in ten weeks or three months the summer-made cheese will be fit for market. In the cheese-room of all well-managed dairies a stove is kept for raising the temperature in the months of autumn and winter; by this means the late-made cheese not only becomes ready much earlier than when left to chance, but is kept in far better condition.

The size Wiltshire cheese is usually made is four to the hundredweight, so long as there is sufficient milk to make them that size (40 cows in the summer months will make about four cheeses, or one hundredweight, per day): as the milk decreases in the autumn and in the spring, they are made five or six to the hundred weight, and sometimes less than that. Loaf cheeses are made in small dairies, but there is considerable more work attending this kind, and though the price is generally higher, still it barely remunerates for the extra trouble.

The cream is taken off the whey after remaining in the leads twenty-four hours; it is then turned to the vaults for pigs. One great object of a dairy manager is to preserve as much of the fatty matter in the cheese as possible, and have as little whey butter as may be. It is seldom that the quantity amounts to more than half-a-pound per cow per week.

The whey is used by some for fattening pigs; by others breeding pigs are kept, who sell the stores at six or seven months old for others to fatten. At the present time fattening is the more general plan pursued, and on some farms large quantities of corn are purchased and used with the whey. In one instance (on a farm of 400 acres) nearly 2,000 sacks have been used annually for some years past. The condition of that farm can be better imagined than described.

I shall now proceed to give an account of the method of making cheese by Keevil's patent apparatus, which has been introduced three or four years. It has so often been exhibited to the public at the different agricultural shows, and at all markets where those interested in cheese-making attend, that I do not think it is now necessary to give a description of the apparatus.

From the testimonials received by the inventor

(Mr. R. Keevil, of Stroud farm, Lacock), and Messrs. Griffiths, of Birmingham (to whom Mr. Keevil sold his right of vending the apparatus), one would be induced to believe it to be one of the most useful of modern inventions; yet it has not, either from the original cost being too high, or for the reason given in the proverb, that "a prophet has no honour in his own country," or some other reason, found its way into many of the Wiltshire dairies.

Cheese is only made once a day when the apparatus is used, the night's milk being set up in shallow leads or tins, and skimmed in the morning, and mixed with the new milk. A portion of the night's milk is heated to raise the temperature to 84 degrees (a thermometer being always used): in the spring and fall, 90 degrees is the standard. The usual mode of colouring and running is adopted, and the usual time allotted for coagulation, viz., an hour; at the end of that time the knives, which are fixed in a beam across the vessel, one half of which are horizontal, the other half perpendicular, are moved gently round till the curd is cut and broken sufficiently small. The knives are then taken out, and the curd allowed to settle. There is no scald used, except in the spring and fall of the year. When the whey is ready to be drawn off, a skimmer is used, to remove the curd from the face of the filter. The plug is drawn out, and the whey runs off at the tap placed at the bottom of the vessel. Care must be taken that on drawing out the plug, the filter is not removed. When the upper portion of the whey is run off, and the curd becomes visible, a cloth about a foot wider than the vessel is laid over it, placing the edges down the side, so that no curd can escape. The pressing plate is then applied by the bearing arms and screw, with gentle pressure at first, gradually increasing it till the whey ceases to run; the pressing plate and cloth are then removed, and a knife passed two or three times round the curd, dividing it into rings. It is then cut across from the centre outwards, say at seven or eight equal distances.

The centre pieces are removed and laid round the outside; the cloth is then spread in the centre, and the pieces of curd put into it, and the ends of the cloth folded over it, when the pressing plate is again applied. This process is repeated, till the curd becomes quite dry. The salt is then added. The curd does not require crushing, but is put in the vats in large pieces, and placed directly in the press. The same process of dry clothing, salting, &c., is necessary, as before described. The whey is not placed in leads as in the old method, but runs directly to the vault for the pigs, as all the fatty matter, it is said, by this process is retained in the curd.

In addition to Mr. Keevil's apparatus, another has within the last three or four years been introduced, known as "Cockey's Apparatus," manufactured and sold by Mr. Cockey, of Frome, in Somersetshire, and as this has not been so frequently before the public, at the risk of being considered tedious, I must be allowed to give a description of it, and the method of making cheese therewith, which I will endeavour to do as briefly as I possibly can to make myself understood. The vessel or cheese cowl, which is made either of tin, zinc, or copper (the latter is recommended by Mr. Cockey, as it does not corrode), is placed upon a raised wooden platform, made wide enough to allow the dairy-maid to walk and perform the necessary operations. In the kitchen or washhouse a boiler is erected, which forces hot water through a coil of pipes at the bottom of the vessel, and back to the boiler, by which the milk is heated to the proper temperature. There are two taps in the pipes within the dairy, at the command of the dairywoman, and near to the vessel, to enable her easily to turn the water off or on. As soon as the milk or whey is sufficiently heated, the taps are stopped, and the water in the pipes is let out into a bucket by another tap at the bottom of the tub, and returned to the tank that supplies the boiler. When all the milk is put in the vessel, the hot water is turned through the pipes till the milk is heated to the proper temperature (85 degrees, carefully tested by the thermometer); the rennet and colouring matter are then stirred into it, and the water is turned off and drawn away from the pipes, and after coagulation is complete, the breaking up is performed much in the same way as in the "old method;" and when nearly completed, instead of adding "the scald," or heated whey, the hot water is again turned through the pipes until the temperature of the curd and whey is raised to 88 or 90 degrees, the stirring stick being kept briskly moving round the vessel all the time, to prevent the curd settling at the bottom, as the heat would then make it tough or "leathery" in a few minutes. The water is again let off, as soon as the temparature reaches the above point, and in a few minutes the curd is allowed to settle, the whey is let off at a tap at the bottom of the vessel, and removed to the leads as in the old system. The curd is then scored with a knife in various directions, and heaped in the middle of the tub, the bottom of which being made convex, the whey drains readily away without any pressure; it is cut and turned three or four times, is then salted and lifted to the mill, which is placed in a wooden trough, some 6 feet long, by 3 feet 6 inches wide, standing about the height of a table in the trough; it is put into the vats as fast as it is crushed, and moved off to the press, when the same process of re-vatting, salting, and turning is gone through, as before described.

I have now finished a description of the methods that are adopted in making Wiltshire cheese. I shall, in conclusion, give you a short statement of the advantages claimed for the new systems by their respective advocates, and I must leave you to form your own conclusions upon the subject.

The chief recommendation of Mr. Cockey's apparatus is the saving of labour. The carrying of the milk for warming, and the whey for the scald, to and from the boiler, is saved by the application of the hot water to the bottom of the vessel: by this method there is also a saving of the labour of dipping the whey, and the labour of pressing the curds with the hands; or a board with a weight is not required, from the formation of the bottom of the vessel. Very great care, however, is required in the management of the hot water; if it remains too long, or obtains too great a heat, or if the curd is not kept properly stirred whilst the water is on, it soon sustains injury; and thus, on the first use of the apparatus, it frequently happens the cheese is badly made. But "practice makes perfect;" and where the apparatus has been in use for a time, it is preferred by some, whilst by others it is not considered any improvement on the old system.

It has not been very extensively adopted. In the lower part of the country and the borders of Somersetshire it is more in use than anywhere else. I know it is used by some parties who have immigrated from Somersetshire, and these parties have also introduced the Somersetshire method of making cheese with the use of this apparatus, and have succeeded remarkably well. There is one advantage I have omitted to mention, and that is the heating of the cheese rooms by the same apparatus—the hot water being forced through pipes laid round the room.

The great recommendation claimed for Keevil's apparatus is a *larger amount of curd from the same quantity of milk,* "*a great saving of labour,*" and the *process rendered more simple and cleanly.* From the published testimonials given by persons who have used it, these recommendations seem to be warranted. It has been proved by experiments, the particulars of which I cannot enter into here (but which may be had on application to the patentee, or Messrs. Griffiths, of Birmingham), that a greater quantity of curd is produced, in some instances to the extent of 12 per cent and the fatty matter is retained in the cheese instead of being carried off in the shape of whey butter; and if we are to believe all that was said on its first introduction, this it does most effectually, as it was said that the pigs literally starved on the whey instead of fattening as in other dairies; but either from such alteration or improvement in the manufacture or the management of the apparatus, I believe the pigs now fare much the same as in other styes, where they get the whey that has been set up in leads, and a little whey-butter made. There is no question but a saving of labour is effected by its use. The breaking up of the curd is done more easily and better by the knives than either by the hands or stirring-stick; the manner of letting off the whey and pressing the curd in the vessel saves considerable labour; the latter is probably the hardest part of the operation when done by the hands. For my own part I do not see that the process is more simple or cleanly than the old system, when due attention is paid to it; but, from what I have seen, the evenness of the quality of the cheese made by it forms one of the chief recommendations: the regularity of the process, the use of the thermometer and the regular pressure in extracting the whey, tend to keep the cheese even in quality. Notwithstanding all these recommendations of the new systems, the dairy farmers of Wilts have been slow in adopting them. Either from prejudice, or from want of further proof of the superiority of the new invention, or the expense that would be incurred in changing to the new, the old system still holds sway: those who have generally succeeded in making good cheese are content "to let well alone."

No doubt improvements might be made by many who hold to the old method, by the use of the theremometer, and working to regular time; in short, to reduce it more to a system. We should not then hear so many complaints of the uneven quality and the value of cheese, as we frequently do at the present time.

I fear what I have said will not enlighten you much on dairy management generally, from want of personal experience in this matter; and from my time being so fully occupied, I have not been enabled to enter into statistics or scientific accounts of cheese-making by the new or old method; but we shall hope to see from some able pen, in the course of next summer, that the Royal Agricultural Society of England has offered a prize for the best essay on the subject. I have only been enabled to offer you a plain statement of the management of our own district, collected chiefly from my own observation.

WAKEFIELD FARMERS' CLUB.

PRESENTATION TO THE SECRETARY.

The Annual Dinner of the Wakefield Farmers' Club took place on Wednesday, March 8th, at the George Hotel, Wakefield. The repast, which was provided by Mr. Haworth, of the George, was of an excellent character, and was well served. The chair was occupied by the President of the Club, W. Belton, Esq., of Chevet, and the vice-chair by T. C. Johnson, Esq.

It was arranged that a testimonial should be presented to Mr. Barratt, for his services as honorary secretary during a period of eight years. The testimonial, which consisted of a silver tea and coffee service in four pieces, was placed upon the table. The pieces are a coffee-pot, a tea-pot, a sugar-basin, and a cream-ewer, the whole weighing nearly one hundred ounces, and being in the Louis Quatorze style, richly embossed. The service was supplied by Mr. Loveday, and its cost was £60. The coffee-pot bore the following inscription: "Presented to Mr. William Barratt, by the members of the Wakefield Farmers' Club, in token of his services as honorary secretary for eight years. Wakefield, Feb. 8th, 1860." On each of the other pieces was engraved a somewhat similar inscription.

After the usual loyal toasts were given,

The CHAIRMAN rose and said: I have great pleasure in presenting this very handsome testimonial to our worthy secretary, Mr. Barratt. I say worthy secretary, and I make use of that word because a great many people who have subscribed to the testimonial have said to me "Will you receive my subscription towards the testimonial? for Mr. Barratt is a worthy man." He came forward at a time of great need. [A Voice: He did.] We were going down very fast indeed; and but for him, we should not be in the position we are now. (Addressing Mr. Barrett) In the name of the Club, I have great pleasure in presenting to you this very handsome testimonial, which I doubt not will stimulate you in your future exertions; for had I thought it would cause you to relax, I should not have favoured its presentation. The Chairman, in making the presentation, alluded also to Mr. Bayldon, whom he called "the father of the Club," and said that it would give them pleasure to see him more among them.

Mr. BARRATT rose to acknowledge the gift. He said often as he had stood up in that club to try to speak, he was quite sure that he spoke the truth when he said that he never felt so unable to speak as he did at that time.

The CHAIRMAN: You will mend as you go on.

Mr. BARRATT continued: Since the testimonial had been named to him, he had, as it was natural he should, thought a great deal concerning it; and he had come to the conclusion that it could not be attributed to the sevices which he had rendered the club, but to the personal good feeling and kind-heartedness of its members. He did but express wha he felt when he said that he was quite sure a more efficient secretary to the Wakefield Farmers' Club might be found than himself (No, no). He thought so, however. Mr. Briggs had told them that during the time he was the secretary the difficulty he had was that of scarcity; but (and he might say that they were always in the habit of considering present difficulties the greatest) that was not the one he had to contend with, but the contrary; his difficulty being how to guide such great numbers, how to please and cater, in a subject of such vast importance as farming for such a body of real practical sterling farmers as they had at that club. He felt his incapacity to perform the duties in the way he thought they should be performed, and he had sometimes thought it would be best if he were to resign his office. He had some knowledge of what a farmers' club ought to be, however; and, though they had not yet reached the point which they might reach, he believed that much would be effected by continual effort; and what they had to do, everyone of them, was to devote themselves to whatever would promote the interest of the club. Mr. Briggs had spoken very kindly in reference to him, and he had felt his heart melted as he spoke; and he could assure them that it always made him glad when he pleased them. His heart was wrapt up in the Wakefield Farmers' Club, and rather than neglect his duties in connection with it he would deny himself of his necessary sleep. That beautiful and handsome present which had been given to him would certainly not render him apathetic, but on the contrary would stimulate him to further exertions. He should like to see the Wakefield Farmers' Club the first club in England for sound practical skill; and even now its lectures had received the high encomiums of the London press, which was not to be wondered at, when they considered what manner of men they were that delivered their lectures. They had had many good meetings in that room, and it was his hope that they should have many more, though he believed it would conduce to the prosperity of the Club if they had a larger room in which they could meet. Again he would say that he did not attribute that present act of kindness towards him to any merit on his part, but to the kindheartedness of the members of the Club. Ever since he had held the post of secretary to them, he had, with some trifling exceptions, been treated with the greatest kindness, and received every assistance from the members of the club; and this he hoped would be continued, though if ever he neglected his duty he would be glad to be told of it. With regard to the club he hoped that all its members would be stimulated to set out afresh, and, by an increase of numbers, combined with wisdom and experience, he determines to make it second to none in the kingdom. He did not think that any club was now superior to it, with the exception of the London Club; and even with regard to that, one of its members told him that in all practical matters it must give place to the club at Wakefield. He hoped that character would continue to apply to them, and if it did they could not fail to benefit the country, for no class of men did the country more good than did the farmers. He had been thinking of that queer man—that nondescript, who now rules across the Channel—who had been taking lessons in free trade from Mr. Cobden, and thinking that if he were to turn the national mind to good farming, instead of ideas of glory, the country would rise, for no country ever throve that dabbled in bloodshed. England, it was true, had had too much of war; but at the same time her manufactures and railroads had gone on, and the result was that no other country had attained such a degree of prosperity. He again thanked them for the kindness manifested towards him that day, and in conclusion he wished to them all, health, prosperity, and long life.

FARMER NEWSTYLE AND FARMER OLDSTYLE.

(From *Warburton's Hunting Songs and Miscellaneous Verses*).

"Good day," said Farmer Oldstyle, taking Newstyle by the arm;
"I be cum to look aboit me, wilt'ee show me o'er thy farm?"
Young Newstyle took his wideawake, and lighted a cigar,
And said, "Won't I astonish you, old-fashioned as you are!
"No doubt you have an aneroid? ere starting, you shall see
How truly mine prognosticates what weather there will be."
"I aint got no such gimcrack, but I knows there'll be a slush
When I sees th' oud ram tak' shelter wi' his tail agen a bush."

"Allow me, first, to show you the analysis I keep,
And the compounds to explain of this experimental heap,
Where hydrogen, and nitrogen, and oxygen abound,
To hasten germination and to fertilize the ground."

"A pretty soight o' larning you have piled up of a ruck;
The only name it went by in my feyther's time was muck;
I knows not how that tool you calls a *nollysis* may work;
I turns it, when its rotten, pretty handy wi' a fork."

"A famous pen of Cotswolds! Pass your hand along the back—
Fleeces fit for stuffing the Lord Chancellor's woolsack!
For premiums e'en Inquisitor would own these wethers are fit;
If you want to purchase good 'uns you must go to Mr. Garfit.

"Two bulls first-rate, of different breeds—the judges all protest
Both are so super-excellent, they know not which is best;
Fair, could he see this Ayrshire, would with jealousy be ril'd,
That hairy one's a Welshman, and was bred by Mr. Wild."

"Well, well, that little hairy bull he shanna be so bad;
But what be yonder beast I hear a bellowing like mad,
A snortin' fire and smoke out?—be it some big Roosian gun?
Or be it twenty bullocks squz together into one?"

"My steam Factotum that, Sir, doing all I have to do—
My ploughman, and my reaper, and my jolly thrasher too;
Steam yet but in its infancy, no mortal man alive
Can tell to what perfection modern farming will arrive.

"Steam, as yet, is but an infant"——He had scarcely said the word
When through the tottering farmstead was a loud explosion heard;
The engine dealing death around, destruction and dismay;
Though steam be but an infant, this, indeed, was no child's play.

The women screamed like blazes as the blazing hayrick burn'd,
The sucking pigs were in a crack all into crackling turn'd;
Grill'd chickens clog the hen-coop, roasted ducklings choke the gutter,
And turkeys round the poultry yard on devil'd pinions flutter.

Two feet deep in buttermilk the stoker's two feet lie,
The cook, before she bakes it, finds a finger in the pie;
The labourers for their lost legs were looking round the farm,
They could not lend a hand because they had not got an arm.

Oldstyle, all soot from head to foot, look'd like a big black sheep;
Newstyle was thrown upon his own experimental heap;
"That weather-glass," said Oldstyle, "canna be in proper settle,
Or it might as well a tou'd us there was thunder in the kettle."

"Steam is so expansive." "Ay," said Oldstyle, "so I see;
So expensive, as you call it, that it wunna do for me;
According to my notion, that's a beast that canna pay,
Who champs up for his morning feed a hundred ton o' hay."

Then to himself said Oldstyle, as he homewards quickly went,
"I'll tak' no farm where th' doctor's bill be heavier than the rent;
I've never in hot water been; steam shanna speed *my* plough,
And I'd liefer thrash my oats out by the sweat of my own brow.

"I neether want to scald my pigs, nor toast my cheese, not I,
Afore the butcher sticks 'em, or the factor comes to buy;
They shanna catch me here again to risk my limbs and loif;
I've nought at whoam to blow me up, except it be my woif."

NOTES ON MEADOWS AND PASTURES.

By JAMES BUCKMAN, F.G.S., F.L.S.,

Professor of Botany and Geology at the Royal Agricultural College.

The increased activity displayed within the last few years in the cultivation and management of roots and cereals has resulted, not alone in a comparative neglect of natural pasture and its substitutes, but, in fact, in the constant demand of material for increasing the turnip, the meadow has too often been deprived of its proper pabulum; and hence arable cultivation has not augmented that of the meadow, but in reality the latter has rather retrograded than advanced. The meadow, then, in all its forms is capable of great improvement; and if we have meadow and pasture as part of a farm, it were surely best to endeavour to develope its produce to the fullest extent, both in quantity and quality. We propose to devote a few papers to an investigation into the natural history and economy of British pasture, taken in its very broadest sense.

The climate of England is highly suitable for the growth of the *graminaceæ,* to which belong the most interesting tribe of plants known as grasses, a tribe of which we have ordinarily recognised two types, namely—

1. Those which produce large seeds, and are hence grown for their seed or corn, termed *cereals*.
2. Those which produce herbage specially adapted as food or fodder for graminivorous animals, called meadow grasses.

At present, we shall confine our remarks to the latter group of plants, taking into consideration plants of other families which may form part of a pasture or become useful as fodder plants, either separate or in a mixture with grass.

If we examine the species of our meadow and pasture grasses, we shall find that they are pre-eminently natives to our soil; in no matter have we been less indebted to foreign lands than this. It is true, however, that we import seeds of many of the grasses that we grow, such as derivative varieties of timothy and ryegrasses; indeed, England, in colonising, has spread her wild grasses over a great part of the globe. We have gathered most of our true meadow and agrarian species in the United States; and it may almost be said that American pastures are all artificial, in the full meaning of that term; for although we see in the more temperate of the Northern States some tolerably fine pastures, and not bad lawns, about the cities, yet both these are truly not aboriginal—indeed, one scarcely more so than the other—but the result of cultivation; and we shall hereafter see that, even at home, cultivation is absolutely necessary, if we would maintain an efficient pasture. Our species of wild grasses may become a large or small list, according to the value we set upon specific distinctions. Thus the genus *Bromus* will, by some, be made to number as many as a dozen species. Mr. Bentham, however, in his "Handbook of the British Flora," has reduced them to seven, whilst for ourselves we should be almost inclined to only pin our faith to four.

The accompanying list, however, is compiled upon the following principles: it is meant to show the number of species of British grasses, judging of these more particularly by a difference not only in form, but in quality. It is generic; with, however, an allocation of the numbers of species affecting different positions, the more particular details connected with which will follow afterwards.

Table of the Distribution of British Wild Grasses.

Forty Genera.	Pasture.	Agrarian.	Wood.	Moor and heath.	Water.	Seaside.	Number of species.
Anthoxanthum	1	—	—	—	—	—	1
Nardus	—	—	—	1	—	—	1
Alopecurus	1	1	—	2	2	—	6
Phleum	2	—	—	3	—	1	6
Ammophila	—	—	—	—	—	1	1
Lagurus	—	—	—	—	—	1	1
Phalaris	—	1	—	—	1	—	2
Gastridium	—	1	—	—	—	—	1
Polypogon	—	1	—	—	—	1	2
Milium	—	—	1	—	—	—	1
Calamagrostis	—	—	3	—	—	1	4
Agrostis	2	1	—	2	—	1	6
Rottbœllia	—	—	—	—	—	1	1
Spartina	—	—	—	1	—	—	1
Cynodon	—	1	—	—	—	—	1
Digitaria	—	1	—	—	—	—	1
Setaria	—	2	—	—	—	—	2
Panicum	—	1	—	—	—	—	1
Molinia	—	—	—	1	—	—	1
Melica	—	—	2	—	—	—	2
Catabrosa	—	—	—	—	1	—	1
Aira	2	—	1	3	—	1	7
Triodia	—	—	—	1	—	—	1
Holcus	1	—	—	1	—	—	2
Arrhenatherum	1	—	—	—	—	—	1
Hierochloe	—	—	—	1	—	—	1
Sesleria	—	—	—	1	—	—	1
Cynosurus	1	—	—	—	—	1	2
Arundo	—	—	—	—	1	—	1
Elymus	—	—	1	—	—	2	3
Hordeum	1	1	—	—	—	1	3
Triticum	—	1	1	—	—	3	5
Brachypodium	—	—	1	1	—	—	2
Lolium	2	1	—	—	—	—	3
Poa	2	4	1	2	2	4	15
Briza	—	—	—	2	—	—	2
Dactylis	1	—	—	—	—	—	1
Festuca	4	—	1	2	—	2	9
Bromus	1	7	2	—	—	—	10
Avena	2	2	—	3	—	—	7
Total	24	26	14	27	7	21	119

This table may be considered as remarkable for showing us how small a number of species of grasses, even of our wild examples, are properly part of a meadow, only 24 out of 119; and yet, if we examine into these, we shall in reality find that the best meadows in England will not present us with anything like half this small number, except as very rare examples, in which cases they may just as well have been left out, in as far as the best interests of the meadow are concerned. We thus arrive then at the important conclusion, that only a few of our wild species of grasses are worthy of cultivation, though all are worthy of attentive study as indicators of condition of soil, some electing to grow under agrarian conditions, in some poor soils, some in ill-drained lands, or even in water, and others preferring the sea-shore; and we think it not too much to assert that an attention to the kinds and condition of growth of various species of grasses is capable of informing us, not only as to the broad phases of character connected with land, but of all the minute inflections of structure, condition, climate, elevation, moisture, dryness, and others; and hence then we look upon the study of grasses as of the utmost importance to those who let a farm, as to he who takes it; to the land surveyor who has to value it, as to the tenant who rents it. Take for example the third genus on our list; it has but three species, and yet each exists under totally different circumstances. Thus—

Alopecurus—Foxtail:

A. pratensis—meadow; a denizen of rich pastures.
A. geniculatus—kneeling; the inhabitant of the wet swag, or shallow water-course.
A. agreslis—slender field; a plant of cold clayey arable.

Again, as an example of the kind of evidence relating to the condition of soil which may be afforded by grasses' compare the following account by a botanist, of the common quaking grass, with that of an experimental chemist.

Briza,media—quaking grass—is so called from the restlessness of its pendulous flowers, which are comparatively heavy, and balanced on delicate rounded *pedicels.* Though a beautiful species, it is of no use agriculturally; however, as it grows for the most part in poor, stiff, undrained clays, it may always serve by its presence or absence as an indication of condition. If present in quantity we may predicate a stiff unmitigated clay, such as are found in the Lias shales, Oxford clay, Forest marble, and London clays, and especially where not visited by local deposits. Undrained or otherwise badly cultivated, these formations will be found to afford too much of this species, and far too little of those of a better quality. If, however, the soil be merely wet, and not of a decidedly stiff description, less of the quaking grass will occur; but the specimens will be far larger in size, and equally useless as food." — *Buckman on British Grasses, Journal of the Royal Agricultural Society*, vol. xvii.

Our next extract is from a report of experiments with different manures, thus—

"*Briza media—common quaking grass.* This grass is reputed to thrive best on poor soils, to afford a small yield, not to be liked by cattle, and to be discouraged by manuring. It flowers in June.

"The quaking grass amounted to 2 per cent. in the sample of the produce from the unmanured land. It was only found in two cases in the manured produce, and then in even less proportion than in the unmanured. In the most highly-manured produce none whatever of it was to be found. The reduction or entire exclusion by manuring, is consistent with the character of this grass as given above. It would seem, therefore, that it is not likely to be troublesome on good land, and that it is easy of expulsion by good manuring."—*Lawes' Report, Agricultural Journal*, vol. xx.

Facts like these, from such independent sources—from the *Botanical Observer*, confirmed as the result of chemical investigation—may well be left to speak for the practical importance of an inquiry into the plants of our meadows and pastures.

In our table of the distribution of the British meadow and pasture grasses, the following general conclusions were arrived at as to their habitats, viz.:

	Species.
1. In meadows and pastures, occur..........	24
2. In the agrarian fields	26
3. In the woods and thickets	14
4. On the moor and heath	27
5. In water	7
6. By the sea-side, within the influence of saline breezes	21
Total	119

From this it follows that every locality has species peculiar to itself, and that those of the meadow by no means form the largest group. We shall now, however, give a few notes upon the distinctive characteristics of the six groups as laid down above.

Group 1.—Here then it will be found that our first group is somewhat remarkable, as it shows that in a pre-eminently pastoral country, where grasses grow so remarkably well, only a little more than one-fourth of the species of grasses belong to the meadow, and even these, if we carefully examine them in the following allocation, may be very considerably lessened:

LIST OF THE USUAL SPECIES OF GRASSES OF THE MEADOW:

1. Anthoxanthum odoratum—Sweet vernal.
2. Alopecurus pratensis—Meadow foxtail.
3. Phleum pratense—Timothy or catstail.
4. Phleum Bœhmeri—Bœhmer's catstail.
5. Agrostis alba vars—White bent.
6. Agrostis canina—Common bent.
7. Aira flexuosa—Wavy Hair-grass.
8. Aira cristata (Kœleria)—Crested hair-grass.
9. Holcus lanatus—Soft grass.
10. Arrhenatherum avenaceum—Oat-like grass.
11. Cynosurus cristatus—Crested dogstail.
12 Hordeum pratensis—Meadow barley.
13. Lolium perenne—Perennial rye.
14. Poa pratensis—Smooth meadow grass.
15. Poa trivialis—Rough meadow grass.
16. Briza media—Quaking grass.
17. Dactylis glomerata—Cocksfoot.
18. Festuca, pratensis—Meadow fescue.
19. Festuca loliacea—Rye fescue.
20. Festuca ovina—Sheep's fescue.
21. Festuca duriuscula—Hard fescue.
22. Bromus erectus—Upright brome.
23. Avena pubescens—Hairy oat-grass.
24. Avena flavescens—Yellow oat-grass.

Now, if we dissect even this limited list, we shall find that one-third only belong to what may be termed useful grasses: the rest mark not the best conditions for a meadow. They may be arranged according to their numbers, as follow:

1. Good deep Meadow soils, 2, 3, 13, 14, 15, 17, 18, 19..................	8
2. Thin Meadow, 1, 4, 5, 6, 8, 12, 20, 21, 22................	9
3. Poor Clays, 9, 11, 16	3
4. Uplands, 7, 10, 23, 24	4
Total	24

From these data it follows that only about eight species of grasses are really of the best; all the others are inferior, or not so good; and if we look carefully to the examples which may come before us of the four kinds of meadow just tabulated, we shall most certainly find that if the grasses are more mixed than stated—and it will be next to impossible to define their limits with absolute exactitude—yet they will prevail upon the plan stated; any admixture, for example, of 2 with 1, or 3 or 4 with 2, will be exceptional cases, and the interloping specimens will ever be starved, and grow in bad condition: as thus, the Aira flexuosa, even if sown, would die the first year in a rich meadow; whilst Alopecurus pratensis could not live in a poor upland.

Group 2.—If these considerations weigh so strongly when we inquire into a confessedly meadow group, it will be expected that those of other localities will be still more out of place when they encroach upon the meadow; and so if we look carefully into the natural history of the Agrarian grasses, we find that these are, as a rule, found infesting our arable culture, in which most of them are weeds of a highly pernicious description; some growing in waste places and way-sides, as

Hordeum murinum—Wall barley,
Bromus mollis—Soft brome,
Bromus sterilis—Sterile brome;

others acting as weeds in our crops, and merely choking up or diluting what might otherwise be good, as

Alopecurus agrestis—Slender foxtail,
Avena fatua—Wild oat;

whilst some are pests not merely because of their growth above the soil, but from their *rhizomata* creeping beneath the ground, and so forming the weeds to which the names of couch, or squitch, has been applied by the farmer; such are

Triticum repens—Couch.
Poa compressa—Creeping meadow-grass.
Agrostis stolonifera—Creeping bent.

Any of these grasses in meadows would be pests almost as much as in the arable field: they are innutritious, and therefore, in growing, would take the place, and food also, of a better kind. And as two things cannot be made to occupy the same space at the same time, the useless should be made to give way to the useful.

Group 3.—With the species of grass peculiar to woods and thickets of course the farmer would have but little to do; however they may be useful as covert for game, they seldom stray from their companions, the trees or underwood. They are, like the preceding, of no feeding value, and therefore not even worth trying to cultivate as pasturage plants.

Group 4.—The species of grasses peculiar to the moor and wild heath are such as, in the mountains of Wales or Ireland, are made to do duty both as green food and hay; but in such cases it will always be found that the creatures that are made to live upon it are of a very inferior description. Such herbage is not, as might at first be thought, altogether the result of climate, as in the less elevated tracts of England will here and there be found stretches of the grass of the moor, such as

Triodia decumbens—Heath grass.
Molinia cœrulea—Blue Molinia.
Brachypodium pennatum—False brome-grass.
Avena pratensis—Oat grass.
Holcus mollis—Soft grass.

These result from a peculiar condition of soil; and any one of them occurring, as they sometimes do in circles in fields of tolerably good pretensions, show a more or less peaty condition locally, which may require a little additional care in draining, and subsequent application of lime or salt, by which the intruder is usually killed; and then the grasses of the meadow will take their places.

Group 5.—Water grasses, though usually of little value for their feeding qualities, are of great use, as showing, at a glance, the peculiar condition of any particular meadow. As their list is but small, we here append it in full.

WATER GRASSES.

Alopecurus geniculatus—Water foxtail.
Arundo phragmites—Reed.
Poa aquatica—Reed meadow grass.
Poa aquatilis—Floating meadow-grass.
Phalaris arundinacea—Reed canary grass.
Catabrosa aquatica—Whorl grass.
Aira cæspitosa—Tussac grass.

Now, most of these will usually be found growing in the water of ditches and water courses and pools; if in the former, they are great pests to the natural drainage of the country, as if a ditch or stream, the one an artificial, the other a natural drain, be choked up with growing plants, the flow of water is naturally sluggish, and so long as these main drains are in bad working condition little good can be effected to a district by the gridiron system of drains; in fact, we have seen the most complicated system of draining of this description inoperative on account of weeds choking up the main water channel, the which, indeed, were they removed, would not unfrequently render the more onerous and expensive method all but unnecessary.

The presence of the Aira cæspitosa in a meadow, in ever so small a quantity—and it is too often a meadow grass—is an unerring sign of a want of drainage. We have seen this grass almost killed out by cutting a drain through it, in the short space of two years—growing, however, with immense rapidity on the accidental stoppage of the drain. In irrigated meadows it should be particularly watched, as a few blades in any part are sufficient to show that the water is partially stagnant; this indication will be more particularly dwelt on when we describe irrigated pastures. Water grasses, then, are useless as food; but as indicators they are not to be despised; for with wet, either all or a part of the year, they grow; but as they die without, their presence is always significant.

Here then, we must be for the present content with having just hinted at the difference of grasses in different positions, and from what has been advanced it will clearly appear, that all the grasses are not useful for cattle food; and, therefore, when they intrude in the pasture they should only be considered as weeds.

From what has been already advanced, it will be concluded that not only may our larger list of grasses be referred to distinctive positions, so that the presence or absence of a species will mark certain conditions of soil and circumstances, but even the smaller list, which we have distinguished as *par excellence* meadow grasses, will seldom be found to prevail in any one single meadow; as thus: the *Poa pratensis* affects sound pastures; but if a pasture be wet, and especially if any part be subject to stagnant water at any period of the year, the *Poa trivialis* takes its place. Again, we find that one species of grass—the *Festuca pratensis*—is capable of taking on three varieties of form, according to position, namely,

Festuca pratensis—of the rich meadow,
——— *loliacea*—of the river flat under flooding,
——— *elatior*—on the rough sandy clays bordering the sea.

But, besides the difference in form as affected by soil, there will ever be a great variation in well-being, and consequently of produce, from the same cause; as thus: in one field *Lolium perenne* may make double the height of culm, and offer leaves not only double the breadth, but increased in quantity according to the nature of the soil of which the meadow is composed.

And, as a still more important conclusion, quality as well as quantity is influenced by the same causes. Hence, then, the nature, quantity, and quality of grass-herbage being influenced by the soil; so these circumstances, if attentively inquired into, will not only enlighten us as to the broader phases in the nature and quality of our land, but even the more minute inflexions of condition may be told from the same facts; and we may therefrom conclude not alone that a meadow may require manure, but, in fact, what should be the prevailing chemical principles that that manure should contain.

From these facts it follows that we are enabled

1st. To predicate the nature of the soil by its grasses, when we have them in "natural pasture."

2ndly. In laying down pastures for a permanency, or choosing grasses for shifting crops, we are enabled to choose the kinds of grasses best adapted to the varying conditions of soil. And

3rdly. These considerations teach us how we may encourage the growth of some kinds of grasses, and discourage that of others.

Now, in treating these three questions we shall take it for granted that our first position has been already sufficiently illustrated. I shall for the present confine our observations to an illustration of the second proposition, and so offer examples of

The Choice of Grasses for various Circumstances.—To meet some of these, the following mixtures are offered as examples, the quantities of course to be regulated by condition of soil, and other slight modifications, only to be known as the result of experience. The clovers are added because they greatly benefit the herbage; but the more particular history of these will form a future subject for inquiry.

The positions tabulated are seven; and each of these, and the reasons for the choice of grasses indicated, will be remarked upon seriatim.

TABLE OF GRASSES &c., FOR DIFFERENT POSITIONS.

Botanical Names.	Trivial Names.	1. Rich Loams.	2. Light Lowlands.	3. Uplands.	4. Irrigation.	5. Green Glades.	6. Covert.	7. Lawn.
Lolium perenne	Rye grass	|	|	|	|	|		|
Anthoxanthum odoratum	Sweet vernal	|	|	|				
Alopecurus pratensis	Meadow foxtail				|			
Phleum pratense	Catstail timothy grass	|						
Dactylis glomerata	Cocksfoot grass	|	|			|		
Poa pratensis	Meadow grass	|	|	|	|	|		|
P. nemoralis	Wood grass					|		
Agrostis stolonifera	Creeping bent grass				|			
Festuca pratensis	Meadow fescue	|						
F. loliacea	Rye fescue				|			
F. duriuscula	Hard fescue							|
F. ovina	Sheep's fescue		|			|		|
Avena flavescens	Yellow oat grass			|				
A. pubescens	Hairy ditto			|				
Bromus erectus	Upright Brome					|		
B. asper	Hairy brome						|	
Arrhenatherum avenaceum	Oat-like grass					|		
Brachypodium sylvaticum	Wood false brome						|	
Cynosurus cristatus	Crested dogstail							|
Trifolium pratense	Red clover	|	|					
T. repens	Dutch clover	|	|	|				
Onobrychis sativa	Sainfoin			|				

Now this table represents the prevailing grasses, &c., in each of the positions indicated, putting aside all extraneous herbage, which will be found abundantly in all of them; and, therefore, we may from this gather the kinds of grasses which we should employ if we have occasion to lay down grass under any of these conditions. Again, as aiding us in a general conclusion as to the nature and quality of the soil and its produce in which such allocation of herbage occurs, we offer the following as a mere approximation to an appraisement of hay-making power, as also of average rent of the four first conditions of meadow.

	Hay Per acre.		Rent Per acre.	
	Cwt.	Cwt.	s.	s.
1. Rich loams, hay, from	25 to	35	30 to	50
2. Light lowland soils	15	25	20	40
3. Poor uplands	10	20	12	20
4. Irrigated meadows, with spring-feed, hay, and aftermath	20	30	60	100

Of course these figures are liable to immense variation, but still as a general rule the amount of this will to a very considerable extent depend upon the variety of the grass herbage, and we now refer to this under the heads given in our table.

1. *Deep Loams.*—The rich deep soils of our English valleys depend for their valuable properties upon the circumstances of their geological structure; most of these repose in "valleys of denudation"—that is to say, they have been scooped out by the action of water. In some we have broad flats between eminences on either side, the whole of which were once occupied by water, though now, perhaps, without water at all, or a small stream or brook may convey away the water of the district after the manner of a main drain. This water action, while it scooped out the stratum on the one hand, yet brought silt and mixed materials into the *bottoms* on the other; and wherever materials are well mixed, we have just the conditions most favourable to the development of meadow. Now we speak of these meadows as being original pastures, and yet in many instances we may trace the marks of the plough in ridges or lands more or less elevated. However, such meadow has usually been in the state of pasture for a long time, and if in a well-farmed district we shall find that it universally contains a mixture of some six or eight of our best grasses, growing very thick, and well matted; but that plants other than grasses—if we except clover—are comparatively few. Such pastures, then, always afford good hay, and usually good crops, and hay may be taken more frequently than in the case next to be described.

2. *Light lowland soils* are such as, being on lower slopes of hills, or resting on a sandy bottom, being the remains of an ancient beach, like some of the vale land in Gloucestershire, are devoid of a mixture of the finer silt and clays, out of which loams are formed. Here the grasses will be more mixed than in the preceding case, though the better kinds will be almost absent, or only represented by much poorer specimens. Other wild plants, however, will be usually abundant, and the prevalence of the plantain and the daisy among the herbage, that take up space to grow without adding to the produce of food; or the stinging nettle, which superadds a positive injury; crowfoot, meadow-sweet, and others which take the place of grass, and only dilute the produce, whether of pasturage or hay. These light pastures, where they cannot be acted upon by irrigation, offer but little scope for improvement beyond a constant deepening of soil by means of marling, mowing, or the application of manure; if we except that process of weeding which is as necessary in pasture as in arable cultivation, and which will be more especially referred to in a future chapter.

3. *Light uplands* are even less productive than thin soil lowlands; but as they are usually the positions for the growth of the varieties of the sheep's-fescue and small but nutritious varieties of other grasses, especially of the perennial rye and a stunted form of meadow grass, the pasture is usually sweet; and as these hardy kinds of grasses allow almost any amount of clipping, such meadows should be almost exclusively depastured,

the quantity of hay they would yield generally rendering them most unprofitable as hay producers. The extraneous plants are abundant, dependent upon the rocky subsoil: if of limestone, a larger number of these will be present than in other soils; but generally the closer it is cropped—that is, the heavier stocked—the less these will become, and on this account these meadows grow more grass herbage than would at first be supposed. While, however, discussing the nature of the grass of uplands, we must not pass over a kind of meadow which is far more general than it ought to be, namely, poor clays, whether of the upland or lowland; as this substratum is always the abode of a very poor, or, as the farmer terms them, "sour," set of grasses, amongst which might be instanced the following—

Avena pratensis, meadow oat.
Brachypodium pennatum, false brome.
Bromus erectus, upright brome.
Briza media, quaking grass.
Cynosurus cristatus, crested dogstail.
Carex, various species of sedge.

Any one of these is sufficient to open the eyes of the farmer as to condition; still, if we look at the deep clay lands of England—and we would now instance the Oxford clay as an example—we shall see good and bad meadows, in fact loams and sterile clays, side-by-side, the latter being, by good cultivation, convertible into the former. For in the old Braydon Forest, those who had got possession of bits of land by the old system of squatting have meadows producing an enormous quantity of keep, whilst over their very boundary hedge the herbage consists of the bad grasses just specified, with a large admixture of orchids, cowslips, and plantains—in themselves no bad evidence that the soil requires all the exertion of the farmer for its amelioration; in fact, it wants cultivating, and no circumstance can show the importance of doing something for the meadow more than the cultivated *oases* one so frequently meets with in the wild stretches of our island.

The consideration of irrigated meadow may well form a paper by itself, to which we shall address our next remarks.

NOTES ON SHETLAND, AND SHETLAND AGRICULTURE.

The termination of one of our many wanderings this year, in search of bracing breezes, found us in the most northerly part of her Majesty's dominions, and afforded us an opportunity of instituting a somewhat hurried inquiry as to the condition of agriculture as there existing. The results of this, supplemented from other sources, we now propose in a brief series of papers to glance at.

There is much that is interesting to the antiquarian and philologist in the history of the Shetland Islands. The Romans are supposed, on good grounds, to have visited them, and to have considered them as the *Ultima Thule*, the end of the world. A still more remarkable interest is attached to them from the circumstance of their having been peopled by the Northmen, the Sea-Kings of early times, whose wild adventures by sea and ferocious descents on many lands have been recorded in Icelandic Sagas. The islands, by these Northmen, were called *Realtland*, the high, or the lofty, land; a designation admirably suggestive of the frowning sea-cliffs which fringe the shores, and against which the mighty surges of the Atlantic are ever beating, carving them out into many a shattered crag and sounding cavern. From this name was derived the modern one of Shetland. This, again, changed by the Dutch into Yetland; from which has been derived the name of Zetland, rendered classic by the pen of Scott, and which affords the title of an earldom. Much ignorance prevails as to the exact relations existing between the Shetland Islands and the other parts of her Majesty's dominions; many conceiving that they form part of the Highlands, and that the people are Celtic in their origin, the Gaelic being their language. This opinion is altogether erroneous. The Islands are in no way connected with the Highlands: they are distant from the Orkneys 150 miles, and separated from them by a tempestuous and dangerous sea. The Shetlanders talk of Scotland as if it were a distant country, with which they may be politically connected, but with which they have no tie of race or kindred. All the remains of a peculiar language or of manners existing amongst them point clearly to their Scandinavian origin. Their language—good English, purer than in Scotland—is now and then intermixed with names and words which would be unintelligible to Celtish, but would convey a peculiar and well-understood meaning to Danish ears. There is a foreign accent in it which strikes a stranger at once, and tells him that he is amongst a people different from those he has met with in Scotland. The tones of their voices are low, somewhat sweet and pleasant, and conveys the idea of a race of gentle and kindly manners. They are attentive and obliging to strangers, and hospitality, free and unbounded, is one of their marked virtues. As regards their social qualities, all we saw of them impressed us with a high opinion. Absence of that beastly intoxication which too often disgraces our streets and pains the passer-by, was not the least pleasant trait we noted during our stay; nor less marked was the absence of angry disputation, and the bandying of oaths and debasing talk, which taint the air of other regions.

Shetland—taking this as the generic title—is formed by a group of islands in close proximity to each other, 90 in number. Of these 32 are inhabited; the others small, and devoted to pasture; and are of all sizes, from the islet or "holme" to the rock of but a few yards in extent. The largest island is called the "Mainland"; on this the capital of the islands, Lerwicke, is situated. The length of Mainland is 55 miles, its breadth 25. The southern part of Mainland is terminated by a promontory called Dunseness—the termination *ness*, in the northern language, meaning a point of land or promontory—the extreme point of which is called Sternburgh Head, on which is erected a light-house. Not far from this point is Fitful Head. Round this part of Shetland the graceful pen of Scott has thrown a romantic charm. The northern part of the Mainland is terminated in the district of North Mavin. It is separated from the Mainland by a narrow isthmus not a hundred yards in breadth. "This singular isthmus," says a native and graceful writer, "is called Mavis grind (*grind* signifying a gate or gateway); and a wilder spot one need not desire to meet with, especially on a stormy winter's day." North Mavin is the most romantic part of Shetland, though perhaps least visited by strangers because of its remote position. Its western shore is exposed to the full force of the broad Atlantic surges; consequently the rocks lie scattered, for the distance of perhaps a mile from the land, in the greatest variety of size and shape it is possible to conceive, besides hellyers (low-roofed, dark caverns), and arches innumerable. It is as if one gazed on the ruins a mighty flood had left, of what may have been pinnacles and gorgeous monuments of art; and the mind is intensely affected by the idea of what must be the power of those winds and waves that toss about such gigantic fragments* easily as a child flings its pebbles here and there on the strand."

Lerwick, the capital of and the only large town in the islands, is very pleasantly and almost romantically situated near the centre of Mainland. It assumes the outline of a crescent, formed by the circular bay, on the sloping sides of which the houses are erected. The main street, if street it can be called, so narrow is it and tortuous, generally follows the outline of the bay; and from this, narrow alleys lead off at all angles, by which the higher parts of the town are reached. From the irregular manner in which the houses are set down, chiefly with their gables seaward, a certain picturesqueness of effect is obtained when viewed from the sea. It only lacks colour to impart to it the liveliness of a continental town; but as the houses nearly all are covered with gray slate, a coldness and chillness result, by no means pleasing to the artistic eye. Partially enshrouded in the mists and sprayey clouds which often sweep the sky of these northern regions, it is a dull and cheerless place to look upon. A novelty is noticeable in the numerous small stone quays by which access is obtained from the bay to the houses which skirt the shore. As there is comparatively little rise and fall of the tide, communication is kept up, Venice-like, from one part of the town to another by boats, of which nearly every family possesses one, or at least a share in one. These being perpetually paddled about—even women and children handling the oar with dexterity—impart a pleasing liveliness to the scene.

The town is protected by the guns of Fort Charlotte, which command the town and harbour. It is fortunate that no active protection is likely to be called for; for a broadside from the guns would, we fear, do more harm to the battery-walls which support them than to an invading foe. Their first discharge would probably be their last and final one.

On the side of the Mainland, opposite to Lerwick, and about five miles distant from it, lies the village of Scalloway, beautifully situated in the bight of a bay, from which a view of the island-studded sea is obtained. Scalloway boasts of one of the few ancient buildings remaining in Shetland. The castle was built by the "infamous Earl Pate," or Patrick Stewart, who built it to aid him in his depredations on the poor inhabitants—depredations backed by such atrocities and cruelty, that James VI. of Scotland sent a force to capture him; which being effected, he was taken to Edinburgh, and there executed.

Opposite Lerwick lies the island of Brenay, or Brana, and divided from it by a bay or sound, which forms the well-sheltered harbour or roadstead of Lerwick. Brenay is six miles long by some two or three in breadth, and possesses some examples of the finest and most scientific farming met with in Shetland, and to which we shall hereafter allude.

Divided from Brenay by a narrow sound, some quarter of a mile in breadth only, but with a strong tide and an easterly wind often impassable, lies the small island of Noss, the distinguishing feature of which is the precipitous headland which terminates its eastern border, the height of which is stated to be 600 feet. The "Holme of Noss" is another, and not the least striking, of its natural curiosities. It is a small rocky islet, covered on its summit with a few yards of pasture; to obtain the benefit of which, a daring mode of access has been devised. An expert climber—one of those adventurous cragsmen who scale the giddiest heights of the worn sea-cliffs in search of the eggs of the sea-fowl, which whiten by their amazing numbers their shattered faces—took boat one day, and, climbing up the perpendicular (nay, in some places overhanging) cliffs, reached the top; at the edge of which, nearest the mainland, he fixed strong stakes, fastening to these a cable, which was passed across the chasm to the mainland, where it was firmly secured. This cable of communication afforded a means of carrying a cradle or box, which served to convey across a few sheep to partake of the pasture thus so daringly won from Old Ocean. At the time of our visit to the "Holme" this cradle was taken away; but as our boat sailed through the narrow channel between the holme and the mainland, we looked up to the dizzy height above us, and formed some notion of the steady eye of him who ventured to scale the frowning sea-wall.

The south side of the island of Bressay abounds in fine examples of frowning cliffs and craggy rocks. We extract from an account of our visit, contributed to the pages of the "Journal of Agriculture" for October, 1858, the following notice of the notabilities in this way: "We took boat one day to explore it, and, being favoured with a day more than usually adapted for the excursion, we coasted along the base of its sullen and frowning ramparts, and drank in to our hearts' content the spirit of Shetland sea-scenery. On the south-west point is a towering headland, some 400 or 500 feet high, the name of which is the Bend of Bressay. Viewed from the sea, it is grand and imposing, the face of the hoary cliff being broken up into towering peak and shattered crag and crevice, trodden only by the foot of the sea-fowl or flapped by the eagle's wing. The interest of the point is wonderfully enhanced by two magnificent arches, perfectly gothic in outline. These are formed by two projecting pillars, or rather buttresses, which by some strong convulsion of nature have been rent from the main mass, and project into the sea so much as to form arches of magnificent width and height, through which the giants of old might have wended without bending their waving plumes. . . . Not far from this point is the entrance to a cave only accessible in the finest of weather. . . . The entrance is formed by a magnificent arch, high overhead, and the sides of which are beautiful with the gorgeous and varied colouring of the rocks. The interior of the cavern is tortuous and narrow, and can only be seen to advantage by the light of torches. Then the glistening stalactites greet the eye, and gigantic figures and unearthly shapes start from the rocky walls, carved by Nature's hands and chiselled into curious shapes and fantastic contortions in ages long gone by. . . . We rowed along the coast some distance further, till we came to a bay or cove enclosed by black cliffs; these started sheer out of the water to a height of, it is said, 700 or 800 feet, twice the height of St. Paul's. The face of this horridly frowning sea-wall was honeycombed by the action of the weather into thousands of tiny nooks and crevices, which afforded shelter for myriads of sea-fowl. As the report of our fowling-piece echoed from the cliffs, they rose in such numbers as fairly to obscure the light, forming a living curtain overhead, and filling the air with alarmed and discordant screechings. It was curious, at the feet of these battling cliffs—which afforded no spot on which a sea-leaguered wretch could plant a foot to climb to safety—to find, as we turned into the cove, two or three tiny boats, with some men patiently fishing with line and rod."

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* We may here note, with reference to the power of the waves in these Northern seas, that Mr. Stevenson, the well-known lighthouse engineer, instituted a series of experiments at the wild and solitary "Skerries," half-way between Lerwick and Unst; the result of which showed the waves to exercise a pressure upon the rocks of *three tons* per square foot. No wonder that old Ocean flings huge rocks about as did the fabled giants of ancient days

On the west side of Mainland, some ten miles from Lerwick, lies a group of islands. The east and west isles of Burra, and the isles of Hevarn and Papa; these form unitedly the parish of Burra. The east isle of Burra is some five miles long, the west isle six; their breadth forms half-a-mile to a mile. The two islands are at one point in such close proximity that they are joined by a rude bridge. The coasts of both isles are rocky. Pasture-ground constitutes the chief part of the isles. Hevarn isle resembles a high rock, access being obtained to the houses perched on the face of the precipice by a romantic creek. Cliff Sound, which separates the islands from the main land, is of difficult navigation in stormy weather; it is half-a-mile broad.

West from Burra, some 23 or 25 miles, lies the island of Foula, forming, with the islands of Papa-Stour and Vaila, part of the parish of Walls. Foula possesses the highest hill in Shetland—Proness Hill—the height of which is 1,476 feet, and the wildest and grandest sea-cliffs, one of which towers above the waters some 1,200 feet—nearly three times the height of St. Paul's—and many are several hundred feet high; all are covered with sea-fowl. Foula Island is about three miles in length, and one-and-a-half in breadth; Papa-Stour, two miles long and one broad. Vaila is a small but valuable island.

The north isles are three in number—Yell, Unst, and Fedar. Yell is an oblong island, the soil of which, throughout nearly, is composed of moss. Although situated in a high latitude—61° N.—the air in winter is remarkably mild, snow rapidly melting. A note taken at the Island of Yell the day before Christmas-day, 1832, is corroborative of this: "The turnips are this day as green as they were at Michaelmas. The ryegrass among bere stubble measures from 8 to 10 inches of green blade, and among the year-old ryegrass the daisy is everywhere seen in bloom." The east side of Yell being in many places low, with a sandy beach, affords easy access to boats in ordinary weather. The south side affords two good harbours. The north and north-east sides abound in scenery wild and bleak. The diminutive sheep of Shetland are reared in great numbers in Yell, and are famed for the fine wool they yield.

The island of Unst lies in north latitude 60° 45′, west longitude 50°. The length is 12 miles, its mean breadth 3. Blumel Sound, a rapid tideway one mile in breadth, separates it from the island of Yell. Although the most northerly island in Shetland, it is the most densely populated, and possesses a surface of country less rugged and wild in its general aspect—so much so that it may be traversed on pony back from one end to the other without being stopped by any difficult obstruction. It has been called the Bath or Brighton of Shetland. The surface is diversified by hills of moderate height; that of Valleyfield—700 feet high—runs along the west coast, and forms a barrier "against the fierce assaults of the Atlantic, which, notwithstanding, dashes its huge billows against it with such force during a north-west gale, that foam and spray are thrown over it into the valley on its eastern side, and strongly impregnate with salt every green herb. This hill terminates in a long projecting headland, called Hermanness (from a hero who is said to have landed in days of old on these shores), the most northern part of the island and of her Majesty's dominions." To the eastern coast a conspicuous landmark is afforded by the hill named Saxa, about 938 feet in height, and which rises abruptly from the sea. On the north-east base of this hill—the face of which is whitened with innumerable sea-fowl—there is a magnificent natural arch, in some places 100 feet high, 300 feet in length, and having a breadth and depth of water flowing under it sufficient to admit of a boat's passage when the weather is propitious. The colours of the rocks forming the roof and sides are stated to be particularly fine. The north part of the island abounds in rocky scenery of the wildest and grandest description: "Nature in her wildest moods here reigns in the glory of unbroken solitude—so far at least as man with his turmoil is concerned; and it is in such a scene that a devout mind perhaps best loves to hold communion with his Creator, surrounded only by His workmanship." Here lies the most northerly point in the British Isles; it is an insulated rock, called the Utsta or Oatstack, resembling in outline a gigantic horse, and right over which the wild waves of the Atlantic not unfrequently pass.

The island of Fedar, the only one of the north isles which a notice is yet to be given, is eastward of Yell, from which it is separated by Colgrave Sound. The island is 7 miles in length, and 4 miles in breadth. The coast is much indented with bays or *vocs*, as they are termed, in the vernacular form, whence is derived the old title of Scandinavian heroes, *vikings voc*, or bay kings. There is a grand natural arch at the eastern extremity of the island, which extends under a piece of pasture land. In heavy weather the sea roars and surges through this opening; and even in the finest weather it presents difficulties of passage, which have, we believe, prevented all attempts at forcing it.

Having given a full an account as our limits will admit of, of the principal islands, and of the variety of Shetland sea-scenery, we now proceed to glance at the peculiarities of soil, climate, and of Shetland agriculture.

The prevailing aspect of the interior land is bleak and gloomy; it is, however, undulatory and varied in character, hill and dale being pleasingly interspersed. Patches of green pasture, in which a few sheep may be seen picking up a livelihood, the precarious nature of which is evidenced in their miserably attenuated condition; clumps of heather, huge boulders, and wide expanses of black moss alone give variety to the landscape. For the hills, and dales, unlike those of other climes, lack the grace which the charm of trees throws over them. The entire absence of all trees is, indeed, that which more peculiarly strikes the stranger in his first arrival on the islands. With the exception of a few trees grown up under the shelter of walls in the immediate neighbourhood of one or two of the houses of the gentry, our eye, during our many wanderings, rested on the foliage of no tree casting its grateful shadow on the grass beneath. Yet it seems pretty well established that trees must have grown to a considerable extent in the island, in former days; and it appears reasonable to conclude that in the absence of any peculiarity in the soil or climate, which absolutely precludes their growth, that a little trouble expended in rearing timber would be rewarded with success. Norway, in a higher latitude, abounds in trees, and it is a suggestive fact, that the cones of the silver fir, common in Norway, not indigenous to Scotland, have been found in the moors of Orkney. In the absence of all thorough trials, there is as much reason to believe that, under good management, trees suited to the climate and soil will grow, as that they will not.

The soil of Shetland generally may be classed as mossy; it is easily worked; the implement used being a very rudely-shaped spade, of which more hereafter. Along the shores of the bays, and in the numerous vales, alluvial soils of good quality, and capable under good management of yielding favourable results, is met with in considerable quantity.

Land is not let by the acre, but by a conventional measurement, varying in extent in different localities, termed a "mark." This word signifies, in the Norse dialect, a coin, a weight, a field, and in the present case it may be translated a share. A proportional quantity of Shetland contains about 14,000 marks, and a proprietor is said to be a laird of so many marks, not acres. All the land, with the exception of the small grazing islands, was anciently divided, as it still remains, into districts of unequal extent, termed *scattalds*, and the boundary lines of each defined and recorded. Each of those contained a certain number of marks, some greater and others less. The marks or shares in any one scattald are of equal value, though they may be very different as compared with those of another; for one district containing 200 marks may be less extensive and valuable than another containing 100. In the event of dividing a scattald possessed by several proprietors, each receives his proportion according to the number of marks or shares in it, which his rental bears. These scattalds are again subdivided into, first, enclosed and appropriated, and secondly unenclosed and unappropriated. The former contain the arable grass, with meadow lands, which bear a very small proportion to the unenclosed or commons. This mode of division into districts or scattalds was, it appears to me, coeval with the settlement of the first Norwegian colonists. Each adventurer with his followers fixed himself in a certain situation, and boundary lines between localities occupied by independent possessors were determined, to prevent collision and encroachment. The division again into marks or shares was obviously to facilitate sale and succession. The reader will here observe some curious points of resemblance between Scandinavian and very recently promulgated principles of colonization. (New Statistical Account of Scotland).

Reference is made, as will be noticed in the above extract, to enclosed lands. But the truth is that inclosures are generally of the lowest and most worthless description. Indeed, not a few good authorities attribute the slow progress of good agriculture to the state of the ring-fences. Generally they are built of turf, and are easily leaped by the sheep, which, agile to an extraordinary degree, and wild withal, require fences of a more than ordinarily excellent kind to prevent them trespassing. One of the most enterprizing farmers in the islands told us that he had been obliged to put away his sheep, such were the ravages they made amongst his crops, and such the difficulties he had in keeping his fences in a good and efficient condition. "Every year," says an authority, "the poor people sustain a loss more or less on this account, and those who have bad fences require to keep a number of dogs for the protection of their property." Another authority, writing of the state of agriculture in his parish, states: "Among the obstacles to improvement must not be omitted the present ring-fences. These are nowhere efficient; and it is only during the summer and harvest months that they are kept in tolerable repair. As soon as the corns are put into the yard, every 'grind' or gate is open; the dikes in many cases pulled down, and suffered to continue in that state, till the young corn appears several inches above the ground. In the meantime cows, horses, and sheep are allowed to pasture at freedom, and swine root up and destroy what years of the best husbandry could hardly repair.

"The farms generally are of small extent, three and four acres being extents not uncommonly met with. They are generally divided according to the old system —'outfield' and 'infield.' The infield is that which receives the best cultivation, and in which the valuable crops are raised. The outfield is seldom manured.

"Leases are by no means general, and the weight of testimony evidently is in favour of the notion that the people are careless about having them Some, however, intimately acquainted with the habits of the people and the condition of the soil, attribute not a little of the general backwardness of agricultural improvement to their absence. On the other hand, there are others who possessas intimate a knowledge of the people and soil, who say that leases are of no moment, and, at all events, if wanted, could be easily obtained.

"Lime is often met with, but is seldom used in agricultural operations: mixed with many of the crude, sour, mossy lands it would be of great benefit to the crops. Limestone is used for building purposes, and is susceptible of a good polish. Sand-stone slate is used for roofing purposes, for houses of the better class. Coal is entirely absent; but nature, ever compensatory in its provisions, lends ample stores of 'peat' to raise the cheerful blaze and the genial heat in the hearths, for there are no fire-places in the huts of the Shetlander.

"Of birds the great pest of the farmer is the mountain linnet. It is particularly fond of turnip seed, and when the turnip plant begins to spring (the seed being in the top of the peeping leaf), swarms of linnets congregate on the furrows, and in a short time whole rows of the embryo turnips are pulled up, and scattered on ground like heaps of ravelled threads. * * The mischief hence arising to the miniature fields of the cottars may be imagined. Indeed a return need not be expected, unless the ground be diligently watched till the plants are all fairly above the soil." The raven is noted for its rapacity, and not content with carrion, it is known to attack and kill even the ponies in early spring, when the hardships of the winter have rendered them weak and almost incapable of defence. Still greater numbers of lambs and fowls fall a prey to the daring attacks of the raven. The corncrake is met with in the fields of the Shetlander, and is considered a bird of good omen, its presence denoting the likelihood of an early ripened and plentiful harvest. Its nest when found is religiously preserved from injury.

When we name the Muscovy rat, the house and field mice, the otter, the weasel, and the rabbit, we exhaust all notes on the zoology of Shetland possessing interest to our readers.

We glance at the peculiarities of the climate, for which word or two will suffice. Moist and variable, it is on the whole mild, rarely presenting great extremes of temperature. Heavy gales torment the coasts, and send across the land showers of sea-spray, which frequently blast the husbandman's hopes. It is the land of mists and mildew, and is seldom blessed with that genial and life-inspiring sunshine which renders spots in other lands so fair and fertile. Tempestous winds, of sudden rise and amazing force, sweep across the corn-laden fields in autumn, and frequently beat out the corn, allowed to remain on the ground in many instances till over-ripe, as completely almost as if effected by the thrashing-machine in the field. Heavy rains are in winter time frequent; thunder and lightning are comparatively rare.

The condition of agriculture throughout the islands is far below the standard of more southern districts. There are, however, some striking exceptions to this as, for instance, on the farm of Mr. Hay, at Lingwall, where there is a large steading, the land well drained, and where crops are raised little inferior in value to many in first-class south-country farms. The same praise may be awarded to Mr. Penny, of Kilderbiston, in the Island of Bressay, on whose farm we have seen crops and well-tilled fields which would have done honour to many a farm in more favoured localities, There are also in the parish of Dunrossness, and at the east of Bressay, excellent examples of what can be done by the exercise of sound judgment and scientific operation, even under circumstances the most untoward. But, as we have above stated, the condition of agriculture throughout the islands is, as a rule, at a low ebb. Many causes might be stated to account for this: space only prevents us to advert to two or three; as, for instance, the general employment of men in fishing, leaving many of the cultural operations to be done by women. We have more frequently witnessed *women digging and dragging a harrow than men.* The want of a systematic rotation of crops; the almost utter absence of drainage; the inattention to securing good and abundant manure; the absence of efficient enclosures, and of the cultivation of the artificial grasses, may be cited as amongst the most potent of the causes of the low state of agriculture amongst the small farms of Shetland.

As to rotation of crops, the following is the most general: First, bere (a coarse species of barley), with the manure spread *above* after sowing; second, potatoes; third, oats, simply harrowed in; ley ("an essential ingredient in every good Shetland rotation") follows this; fifth oats; next bere, which begins the rotation again. In Bressay, the mode of cropping, which has been followed from time immemorial, is, oats and bere alternately in the in-field, potatoes being raised once in every four or five years. In the parish of Lingwall, an improved rotation has been introduced: First, turnips and potatoes; second, barley with grass seeds; third, hay; fourth, pasture; fifth, oats. In Scolen—one of the north isles—a varied rotation for the in-field is practised. First (1), potatoes; (2), bere, with manure above; (3), oats; (4), oats; then commencing with potatoes again. The second system is, (1), potatoes; (2), oats; (3), bere, with manure below; (4), oats; commencing with potatoes again. The third system is, (1), potatoes; (2) and (3), oats; (4), bere, with manure below; then potatoes. For the in-field oats and ley alternately. In North Yell the land is cropped every year, rotation, bere, oats, and potatoes; but the land must be manured every year, except to potatoes, which are always planted in in-field ground. In Unst, the soil is excellent, and capable, under good management, of yielding highly-favourable results. The system of out-field and in-field is carried out. The out-field is seldom manured: it is turned over every alternate year with the spade. Notwithstanding, good crops of black oats are raised in it. The in-field—that nearest the farm-house—is yearly manured, and in it they raise fine crops of bere and potatoes.

The implements generally used are few in number, and rude in construction. Only on the best conducted farms is the plough used—that being generally the Scotch swing plough. The soils we examined seemed admirably adapted for the working of Howard's wheel plough, which, under good hands, would, we are persuaded, work wonders. The old Shetland plough is fast disappearing; we saw only one specimen of it, and that, not being in use, we hunted up from amidst a lot of lumber in an out-house belonging to a small farm near Sculloway. It is an odd-looking implement, and at best is only calculated to scratch the ground. It is constructed entirely of wood, with the exception of the rude coulter of iron. In appearance it is as unlike a modern plough as can be conceived; all that can be said of it is, that it contains the rudiments of the modern plough. The spade used in the Shetlands is a queer-looking implement; but inefficient as it looks, it does work wonderfully well, and quick. "The blade is very narrow," as we explain elsewhere, "and short, about five inches each way, and tapers considerably to the edge; the shaft is long and tapering, about four feet in length, and is unprovided with a handle or cross. So narrow is the blade that no room is afforded on either side of the handle to put the foot on, for leverage, as on our spade. To obviate this, a little above the blade a mortice is made in the shaft, into which a piece of wood is inserted, this projecting on the right side only. The method of using this primitive implement is peculiar, and with it land is rarely cultivated by one individual; generally three workers stand in a row. Pressing the blades into the soil with their right feet on the projecting pieces, they simultaneously lift the loosened part, turn it over, and break it up with a few blows on its surface; they then move to the right, and perform the same operation, and proceed till the whole breadth is broken up. In lifting the soil the two outside workers make their spades tend with a peculiar movement of the body towards the centre worker." The digging with this spade is much facilitated by always working downhill; at the lowest point of which the best earth accumulates, in consequence, to a considerable depth. The harrow is of a very simple construction, about three feet in length, and with wooden teeth. We have seen it dragged by a woman, as stated above, more frequently than by a man. Rude as the harrow is, it is, however, not used in some districts; but a still ruder substitute adopted in the shape of a broom or heather besom. The *drill* is almost unknown. We are not aware of any corn drill being used in the islands; and only of one turnip drill—this being on the farm of Mr. Penny at Bressay; and so little was its use known at the sale of a lot of goods at which it was put up, that Mr. Penny obtained it for a mere trifle; it being looked upon more as useless lumber than an article of utility.

As will have been observed from the notices of rotation which we have given, the crops generally raised are oats — "bristle-pointed oats (*Avena strigosa*), perhaps, one of the most valuable varieties of dark oats"—beans, and potatoes. The potatoes generally are a good crop; in the parish of Lingwall great quantities are raised. They are allowed to remain in the ground till quite ripe. They are planted in drills, and horse-hoed. In Lingwall the "ground fog" is often a scourge to the potato crop. This is a species of exhalation rising from the boggy grounds after a slight frost; it is seen to arise like the smoke from a great many fires, and gradually extends over all the marshy ground. Wherever it goes "it instantly destroys vegetation. The potato crop in particular is ruined whenever it reaches it. Not only do the stems soon wither, but the poisonous matters seem to descend into the bulbs, which renders them so unpalatable that some seasons even the swine will not eat them." Thorough drainage alone will get rid of this scourge, but want of capital unfortunately precludes all hope of this being done extensively in the Islands. Wherever it has been done the advantages have been at once apparent. Mr. Lay, at Laxfrith, in Lingwall, has drained largely; as also Mr. Penney, at Bressay. Wheat, as a crop, has at various times been attempted to be introduced, but without success; the moist and sunless skies of Shetland are not propitious to it. All the corn crops are allowed to remain till they are dead-ripe—a fertile source of loss, for the winds which rise so suddenly act as thrashers, and cause a large per-centage—in some cases the whole—of the crop to be lost.

Turnips, although a comparatively new crop to the Shetlanders, is a very successful one wherever introduced. The fly—the scourge of this crop in southern districts—is here altogether unknown. The only enemy the crop has is the mountain linnet, to whose depredations we have before alluded. Crops of turnips are raised on many a plot which would raise the envy of many a south-country farmer.

The hay, generally, is obtained from the natural meadows, and comparatively little pains is taken to secure a good sound crop. A coarse kind of hay is collected for litter; it is known as tekk, and is composed principally of heath and rushes cut from the common. It is to be regretted that the example set by some enterprising farmers in growing the artificial grasses is not more generally followed. As elsewhere, so here, this kind of cropping would bring other improvements in its train.

Manure is generally composed of farm-yard dung, sea-weed—of which large quantities are used—ashes, and mould.

On making acquaintance with Shetland *stock*, especially in the early part of summer, the first thought of the stranger must be that of wonder and surprise that animals in such a miserable state of attenuation can be worth anything, or produce anything. They are, however, despite their forbidding, "gaunt, ungainly" looks, more valuable than one would suppose. The "native black cattle is the best adapted to the climate and food. No animal, in proportion to its size of bone, has ever been known to carry a greater weight of fat." It is much to be regretted that so little attention is paid to selecting good stock, and so little care given to the breeding and rearing. "The cow is small," says the new statistical account to which we have, with other sources, been indebted for much matter supplementary to, and corroborative of our own observations, the fore-quarters seldom weighing more than two cwt. The quality of her milk is excellent, and its quantity, in relation to her size, abundant; sometimes reaching sixteen imperial quarts a day. The ox is active, gentle, and docile; and for draught, is better suited to the present state of Shetland than the horse. Both ox and cow are often fourteen and sixteen years old before they are fattened for the knife, and yet the beef is observed to be tender, fine-grained, and highly flavoured. Owing to the scantiness of their winter feeding, they are usually very lean when put to summer grazing; thus much of the beef is what is termed 'new.' Their food is natural pasture, containing many aromatic plants."

It is difficult to describe the peculiarly odd appearance presented by a Shetland sheep as it starts up before you in your first wanderings among the moors, with scraggy necks "long drawn out" to stare at you; tangled wool hanging festoon-fashion from its miserably thin body. It in few points resembles the south-country sheep; yet its flesh is fine flavoured, and its wool—as all our lady friends know—is of the finest and most delicate texture. The damper the moor on which it pastures, the finer the wool. The Shetlanders well know its value, and work it into all manner of things, pretty as well as useful. It is difficult to get out of a Shetland hut without being almost forced—at least, most perseveringly persuaded to purchase some article of home-knit wool work, such as shawls, scarfs, mits, or hose. Some of these articles are exceedingly beautiful. The sheep is a source of considerable profit to the Shetland proprietors. Losses, however, often occur through their falling into the sea from the craggy precipices, on which they seek their food. On some of the small islands, where the pasturage is richer and more luxuriant than on the commons of the larger islands, the Leicester breed is found to thrive as well as any other.

The Pony.—The Shetland pony, known to everyone, next claims our passing notice. Strong for their diminutive size, they are much prized in the coal mines of the North of England, where they are employed in drawing the waggons through the low narrow galleries. The demand for this work has greatly raised their value. Some years ago you might have purchased a stout shaggy-maned fellow for 35s. or 40s.; now you are asked from £6 to £10, and for special animals as high as £15. They are very hardy in their habits, or, at least, by the Shetlanders are presumed to be so, as little or no care is taken to feed and house them. It is only when a severe snowstorm arises, completely precluding all possibility of their picking up anything to eat outside, that they flock toward the house, when the proprietor doles out a scanty meal of hay or tekk. "He does not arrive at perfection till eight or nine years of age; seldom stands higher than 44 inches, for the most part about 38 inches. The general colour is a dark mouse-grey, and he is covered with long woolly hair till three or four years old. He is singularly free from vice, but is not so docile or sagacious as high-bred horses."

Hogs are universally kept, and many of them allowed the free use of the Shetlander's hut, on the hearths of which we have seen them taking a comfortable snooze. They are, like the cattle, of a peculiar breed. "Small boned, erect ears, woolly next the skin, active, hardy, and easily fed; and the pork is of very delicate flavour."

Geese are kept in considerable numbers, but the flocks might be increased with much advantage to the interests, and with little addition to the labour, of the Shetlanders. The same remark applies to poultry, which are aso kept.

SUPPLYING PLANT FOOD AT THE SURFACE.

In the reported discussions that took place during the evenings of the late New York State Fair, much diversity of opinion, as to whether manures should be applied at or below the surface, appears to have been entertained—some farmers even contending that the nature of the soil, for what reason it is difficult to imagine, should determine the question. Certainly, as long as our manures remain what they are, in their properties and proportions, I think it quite doubtful whether any natural reason or fact consistent with nature can be adduced that will justify the practice and cost of *burying manure*, thus placing its organic parts beyond the reach of the crop, and the bulk of it where it will not improve by the disintegrating processes that are so much dependent upon the free access of atmospheric elements.

It is a mistake to suppose that we are to *oppose* nature, especially as connected with all processes of growth, by art; on the contrary, it is the highest art so to remove obstructions, and place the elements, or such of them as we can manipulate in the best known position to give nature the fullest and most effective scope of action. Hence, when any doubt presents itself, the test that will solve it, and decide it generally, is the course we propose, contrary to, or in accordance with the course of nature. If the latter, it is right in principle, however defective in arrangement, at all events.

If we look about us a little, we find the natural plant food that produces our gigantic swamp timber, and the immense annual growth of the natural grasses on low lands, composed of humus arising from the decay of the annual growth of these, invariably applied or deposited on the surface; and that we get larger crops and growth of natural grass, and self-manured swamp timber the result of natural surface manuring, than art has yet been able to produce. Growth is always by similar processes; hence the intervention of art can never *change* the manner in which plants absorb and grow. There can be little question of the fact that the mineral or inorganic parts of plants must be prepared by the influence of heat *at the surface* before being available as constituents of growth. Hence the large supply and depositure of mineral matter from the decaying grass and the leaves of trees on the *surface*, teaches us that even these inorganic elements are best applied as a *top* dressing; and that they are much more likely to reach the roots—through which they must re-enter the tree before ascending to the leaves—than would be the case if placed five to eight inches beneath. And as to the organic parts, all of these derived from manure by any crop, comprising generally full seven-eighths of its whole bulk, must come to the surface and ascend therefrom in gaseous particles, before feeding the plant through its leaves, or becoming plant food.

Plants have the power of transferring crude mineral matter gradually but certainly into their own structure; hence it is an illusion of Liebig's to suppose that soils can be exhausted of mineral matter. On the contrary there is, as we all know, frequently too large a *proportion* of it. Hence, the question is not whether it will be exhausted, but how can it be transformed into available plant food? This, I think, can be answered. But it is clear that mineral matters will best promote growth when applied on the top soil, because it must pass thence down on to the tops of, and amongst the roots, in its natural descent, whether in solution or by gravitation.

We find the *place* of separation of the organic from the mineral parts of natural manure, to be on the *surface*, and that the medium (water) that carries the one downwards, and supplies vapour to facilitate the ascent of the other is applied at the *surface*.

To suppose that roots have as large a proportion in the active functions of feeding the plant generally—I say *generally*, because the powers of plants vary in this respect—as some seem to imagine, is equivalent to denying that the natural proportions in the formation of plants and trees are not the best; for, admitting that in most growing trees and plants the branches and stems are nearly equal in surface and bulk to the roots, and not greater, we have further to consider the supplementary or excessive proportion of leaves. The latter have in a vast number of trees and plants much more surface than roots, stems, and branches altogether, showing, as I conceive, by the strongest analogy, that plants must derive much the most of their substance by way of their leaves. And I am confident the more this subject is investigated, the more popular surface manuring will become, because it is both a principle and a law of nature.

Practically considered, surface manuring or top-dressing has many considerations to recommend it. One of these is, that it enables us to draw the manure out of the way, and out of the room or places that we require for making new mixings in. Another is, that we can do this at a time, namely after fall ploughing is (and generally all ploughing should be) done, and frequently when frost renders it impracticable to plough at all. Small or large quantities of manure can be drawn at much less cost in the value of time, at such season, than in the spring. The manure itself is also dryer, less weighty, and bulk for bulk can be much more rapidly and cheaply handled late in the fall, than in the spring, besides the saving that is effected by preventing waste by washing and soakage, that in too many yards depletes the dung of its most valuable ingredients, if left to be go got out in spring. Add to this the advantage of spreading directly from the waggon or cart on all fall ploughed ground, intended for early spring sowing with oats, wheat, barley, &c., and by this means saving the labour of heaping, and its necessary consequent, much more unequal distribution, than is incident to spreading from the load, and thus preventing the unnecessary occupation of busy springtime with work that properly belongs to the fall, and we have a pretty strong array of economical considerations in favour of manuring on the surface in the fall, thus following the course and example of nature, either as to manner or time.

In regard to the functions of roots, of which I, health permitting, shall have something to say in opposition to the views recently enunciated by a Harvard professor, I can here only add, they undoubtedly have to perform important mechanical ends, and to take in mineral matter in suspension or solution, which the water serves to convey to the leaves, hydraulically as it were. And when matter, destined to be absorbed by the roots (as before hinted), passes on to the tops of them in soaking down, it will naturally pass down around and meet beneath them on the principle of cohesion, and because there is more water in the root to promote such cohesion than in the soil in an opposite direction. Thus, the particles intended for its sustenance will come in contact with the *whole* of the root bark or covering, whereas, if such parts of the manure be ploughed in, many, perhaps most of the roots will only come in contact with it on their *under* sides, and the nutrition they derive will therefore be much less than when the whole surface has been equally in contact with matters that supply nutrition.—J. W. Clarke, *in the Country Gentleman and Cultivator.*

CATTLE'S TONGUES—CURRY-COMBS.

The tongue of a cow or ox is suggestive. It is armed with a compact bed of spines, very rough to the touch, and adapted to a variety of uses. With this pliable member, it draws grass between the teeth for cropping, and all other articles of food when necessary. It comes in play in reaching up into the limbs of trees for foliage or fruit, or in reaching over walls and fences after forbidden crops. The tongue is also used in disturbing the hair and skin on all parts of the body within reach, and the inaccessible parts of the head are curried by mutual accommodation. No sight is more common in a herd of cattle than this reciprocal toilet of the tongue. Here is nature's hint for the use of the card and curry-comb. These tools are especially called for in winter, when cattle are kept in stall, with their heads confined, so that they cannot use their tongues upon their own skin.

It is said by old ostlers, that a good currying, brushing, and rubbing down once a day are equal to a feed of oats for a horse. However this may be, there can be no doubt that it greatly promotes the comfort and health of horses and cattle. It removes all filth from the skin, which is apt to accumulate in stables, unless currying is attended to daily. The skin is constantly throwing off effete matter, which collects around the roots of the hair, and stops up the pores, unless it is in some way removed. The tongue does this partially, but the card and curry-comb do it still better. This office is performed for the horse quite regularly, because he is more frequently exhibited in the presence of his owner, and the cleanliness of the carriage, and of the clothes of the family, depend somewhat upon the condition of the skin of the horse. But the ox, the cow, and the young animals, are sadly neglected. It is not unfrequently that a yoke of oxen will come out of the stable in the spring, with a thick plaster of filth upon their hams, the accumulation of a whole winter—a disgrace to humanity, and to the good husbandry of the owner.

All these animals manifest their pleasure at the use of the card and curry-comb upon their skins, and after a little practice the young stock will come as regularly for their carding as for their food. It is an excellent method to tame heifers that are to bear their first calves in the spring. They become accustomed to the handling of man, and submit to the first milking without much resistance. It is equally good for steers that are soon to be brought under the yoke. They become so gentle under gentle treatment, that they are easily broken to the yoke, and make a more tractable team than by the ordinary process. The card is a much better persuader than the ox-whip. This is excellent business for the boys, and they should be taught to keep the card moving.

ON THE INCREASED PRODUCTION OF WOOL.

We have from time to time drawn attention to our deficient supplies of wool, and the importance of increasing the production of this valuable staple in every quarter. The subject is again pressed upon our notice by a glance at the general imports of last year, and by a paper recently read by Mr. Wray before the Society of Arts, "On the Means of Increasing the Production of Sheep's Wool and of Angora Goats' Hair." Those who have given any attention to the woollen manufactures are aware that this, the second great industry of the nation, is mainly dependent upon a large and regular supply of cheap foreign wool. Our home produce is very considerable, but it is by no means sufficient to meet the growing wants of the trade, even for the goods consumed at home, much less for the large quantity of woollen manufactures exported. Mr. Wray tells us that "the United Kingdom itself produces a larger amount of wool than any other country in the world, its estimated yield being about 275 millions of lbs., obtained from 50 millions of sheep; and yet it may truly be said that sheep are kept in this country not so much for their wool as for the meat their carcasses furnish, and for the great benefit they confer on agriculture. They have indeed been aptly designated 'the sheet-anchor of British agriculture,' so indispensable are they to the scientific farmer of the present day. But in improving the carcass of these valuable animals, great care has also been bestowed upon their wool-producing capabilities, in order to preserve and increase as much as possible the quantity and quality of that important article. The wools of this country are, therefore, abundant in quantity, and of good, strong, and very useful qualities; although not of such fine description as the Saxony, Spanish, and other merinos."

We will not stop to argue the point here, as to the quantity of sheep and production of wool in the kingdom, which are both, we consider, set too high—50 millions being too large a number, and 5½lbs. much too high an average clip. But we will proceed to examine our sources of supply from our colonies and foreign countries, a question in which great interests are involved, and upon which the steady progress of the woollen and worsted manufactures mainly depend. Wool is now at a higher price than it has stood for some years —middle wethers being quoted at 19d., and brokes and noils at 1s., while foreign and colonial are high in proportion. Of about 124 million lbs. imported in 1858, 86 millions, or more than two-thirds, came from our own colonies. Australia and New Zealand in the last two years have supplied us annually with nearly 53 million lbs., and of 130 millions in 1859, 82 millions were from British possessions. Victoria and New South Wales send each about 17 millions lbs., South Australia 11 millions, Tasmania 5 millions, and New Zealand 2 millions. The average increase in Australia appears to be 75 per cent.; but disease, drought, wild-dogs, and the natives, besides the demand for the butcher, make heavy inroads upon this increase; and the progression is nothing like in the same ratio to what it was formerly. There may be exceptions to this decline in New Zealand, the new colony of Queen's Land, and in South Australia, but in the other colonies adverse influences are at work.

The decline from the former rapid increase in live stock in Australia is evident to everyone who has watched the official statistics of the several colonies. Thus the number of sheep in New South Wales has fallen from 8,602,000 in 1855 to 7,582,000 in 1858, and in Victoria from 6,000,000 or 7,000,000 a few years ago, to 4,766,022 in 1858. The principal cause assigned for this diminution is the growing demand to supply the Melbourne meat markets, 1,000,000 a year being required for slaughter. There is also much less attention paid to pastoral operations, and a deficiency of shepherds and shearers. The Governor-General of New South Wales suggests that it is desirable to change the kind of sheep, substituting, as in England, an animal with a coarser fleece and a heavier carcass for the fine-woolled varieties.

In 1854 the Cape colony produced but 8½ million lbs. of wool, whilst in 1859 she exported upwards of 18 million lbs., or more than either Victoria or South Australia. Still, its sheep-farmers have to contend with numerous difficulties—wild animals, drought, and depredations by Kaffirs and bushmen, besides long and expensive transport to the shipping ports. Boundless tracts in the Cape colony, in the Orange River sovereignty, and in Natal, still remain unoccupied, although admirably adapted to their purposes. With peace on the borders, and more farm-servants, the progression in wool production in South Africa will be immense, and soon far exceed the advance already made, in a few years. The quality of the Cape wool is also yearly improving, and the sheep-breeders, as we have on former occasions pointed out, have taken great pains to improve their flocks. Last year there was a decline, however, of 3 million lbs. in our receipts of South African wool as compared with 1858.

The supply of Indian wool has been greatly increasing within the last few years, to the surprise of many. We now receive about 16 million pounds out of 19 shipped from Bombay, chiefly brought down from Central Asia. These low coarse wools are suited to many manufactures, and being obtained cheap find a ready market. Mr. Wray talks very largely of the wool-producing capabilities of British India generally, but we cannot agree with him in his sanguine ideas of what may be anticipated from thence; and a very long period (if indeed that time ever arrives) must elapse before anything like either the quantity or quality he speaks of is attained. "The exports of really good wool," he says, "from British India should be 200 millions of pounds per annum, instead of 18 to 20 millions, and if they do not attain that amount within a few years, then I assert, that the fault will be due to the supineness of this country, rather than to the capabilities of India itself." It would seem that our supplies of Indian and African wools are being directed to France or other markets.

From China we have lately been receiving several million pounds of coarse wool, and there is no reason why the shipments thence, as trade with the interior is opened up, should not increase.

In the United States there are about 30,000,000 sheep, but the clip of wool is small, scarcely averaging more than 2 to 3 lbs. per head. As the whole of the native production is used at home, we have nothing to look for from thence in the raw material, although now and then small shipments have been made to this country when the price ruled high. Mr. Wray gives a humorous picture of the ravages of dogs in the flocks, and believes that some years hence America will produce much more wool than will be required for her own consumption.

The Continent is becoming a very extensive customer or foreign wools of all kinds. Take even the case of the South American wools. The exports of wool have doubled from Buenos Ayres in the last five years, but we have not increased our supplies from thence, which stand at the same amount now as they did in 1855. We then received one-sixth of the entire shipments: we now only get one-eleventh part. Out of 27,000,000lbs. last year only about 2,500,000lbs. came to England, while the Continent obtained the bulk of the remainder, France receiving 6,280,000lbs., Belgium and Holland 9,000,000, and Italy 2,100,000lbs., while 7,000,000lbs. went to the United States.

Mr. Wray advocates strongly the introduction of the Shanghai sheep into our colonies as a cross, being a very prolific breeder, frequently producing 3, 4, or 5 lambs at a birth. This he considers would give a more rapid extension to our flocks. The Cape colonists, many of whom were present, however gave the preference to the improved French breeds, which they have recently been importing.

The importation of alpaca and mohair, and their extensive application in European manufactures, only date from a quarter of a century back, and yet they have risen into immense importance, and would still further advance but for the limited supply, and the high price at which the raw material keeps, with a yearly advance in price. Of mohair, or Turkey goats' wool, we received about 5,000 bales less last year than in 1858. France has gone largely into the manufacture of mohair fabrics, and the fashion having run much of late years upon this class of ladies' material, there is a brisk demand for the wool. Until, however, some progress is made in the rearing of the alpaca and the Angora goat in our own possessions, we must continue dependent for our supplies on Turkey and Peru. Something, however, has been done in this matter: a fine flock of alpacas has been introduced into New South Wales, and many of the Angora goats into South Australia and the Cape. By a cross with the common goat, the production of this long silky hair or wool may be largely extended. Mr. Mosenthal, of the Cape, who was present at the Society's meeting, gave some very interesting details respecting his introduction and experience of the Angora goat, and the profits to be derived from it. We propose, indeed, at the first opportunity to give Mr. Wray's paper in full, with the discussion that followed.

CHICORY AND ITS USES.

The re-imposition of the duty on chicory, proposed by the Chancellor of the Exchequer, calls for a few remarks on the culture of this root, the trade in the manufactured product, and the extensive use of the powder here and on the Continent. In many quarters the very name of chicory has become a matter of offence. But this arises, as has been justly observed, not from any unreasoning dislike to the plant or beverage, but from the fact of the gross adulteration of coffee, under the plea of mixing it with chicory, and the still less excusable adulteration of chicory itself with the most noxious substances. This is a great injustice to the purchasers, and an injury to our colonial coffee planters, who find the extended sale of the berry checked thereby. It is only in Europe that chicory has come into use. It is to the fact of its cheapness, and its containing sugar easily caramilized by heat, that its extensive use may probably be attributed. For this, the flavour of burnt sugar appears to be a general favourite in our beverages. The quantity found in chicory is very much less than in coffee.

The cultivation of chicory on the Continent is not of recent date. Its use has existed for nearly 70 years. When coffee as well as sugar and other colonial produce became high-priced in France and Germany, chicory was almost universally used by the labouring classes as a substitute. As Von Thaër truly observes of all plants which have been proposed as substitutes for coffee, and which when roasted and steeped in boiling water yielded an infusion resembling coffee, chicory is the only one which has maintained its ground. Indeed even in this country it is held in extensive public estimation. At first it was only mixed with pure coffee as an adulteration, by fraudulent dealers. But this practice extended itself so widely, that for the defence both of the honest dealer and of the public the sale had to be legalized, and much chicory in the unmixed state is now bought and used instead of and along with genuine coffee.

Finding there was an increasing demand for the root, it soon came to be cultivated in this country as a marketable crop, being raised chiefly in the counties of Kent, Surrey, Essex, Bedford, Norfolk, Suffolk, Chester, and York. The extent of the home-production has never been very accurately ascertained. In 1840 Mr. McCulloch estimated it at 3,000 tons; and in 1850 it was computed to have risen to 6,000 tons. For within a circuit of ten miles of the city of York 3,000 acres were under cultivation with this crop in 1850. The yield of root from an acre is about 10 tons; which is reduced by drying, &c., to about 2½ tons. The admission duty free of foreign-grown chicory in 1854 led to the abandonment of much of the home culture; and if we are to believe Mr. Gladstone, there are not now 500 acres under culture with chicory in Great Britain.

Mr. Braithwaite Poole, in his work, "The Statistics of British Commerce," published in 1852, stated that there were then about 10,000 acres under cultivation, producing 70,000 tons of green root. The actual production made into chicory powder in England and Guernsey he estimated at 14,000 tons, which at £22 per ton gave a total value for the crop of £308,000; the duty on foreign was then £20 per ton for raw, and 6d. per lb. for roasted. In 1853, it was stated by a deputation of the coffee planters, that the consumption of chicory in this country amounted to 12,000 tons per annum.

How far circumstances are gradually giving to the infusion of chicory, in some countries, the character of a national beverage, may be judged of from the fact that we now import 6,000 tons of foreign-grown chicory, besides the unascertained quantity produced here, which may be half as much, or fully as much again—that the quantity of the dried root consumed in France is about 16 millions of pounds a year—and that in some parts of Germany the women are becoming regular chicory-topers, and are making of it an important part of their ordinary sustenance.

The late Professor Johnston, in his "Chemistry of Common Life," speaking of chicory, says: "When ground, and exposed to the air, it becomes moist and clammy, increases in weight, and acquires a distinct smell of liquorice and a sensibly sweet *first* taste. It possesses in no degree the pleasant aroma which recommends the genuine roasted coffee. When infused, even in cold water, it imparts to it a dark colour, and a sweetish-bitter taste. To many the addition of a little of this bitter liquid to the infusion of genuine coffee appears an improvement—a remarkable illustration of the creation of a corrupt taste by an adulteration, which taste demands afterwards the continuance to satisfy its own craving. The bitter substance itself, however, is not considered unwholesome. Very many bitter substances of this kind possess a tonic property, and it is not unlikely that the bitter of chicory may be among the number. "But the use of chicory," adds the Professor, "appears to have originated from other causes than the discovery, or even the supposed presence of a tonic property in its bitter ingredient. A little of the roasted chicory gives as dark a colour to the water, and as bitter a taste, as a great deal of coffee, and hence it was originally introduced into the coffee-houses for a purpose akin to that which takes cocculus indicus into the premises of the fraudulent brewer—it gave colour and taste to the beverage of the drinker, and at the same time saved the expensive coffee of the seller. The public taste gradually accommodated itself to the fraudulent mixture: it became by-and-by even grateful to the accustomed palate, and finally a kind of favourite necessity to the lovers of *bitter coffee.*"

Tracing down the fiscal charges on chicory, we find that a quarter of a century ago the duty on the raw or kiln-dried root was £1 per cwt., and on roasted or ground £2 16s. per cwt. under the 6th and 7th Will. IV. c. 60. By an excise order, dated Aug. 31, 1840, it was ordered that no objection be made on the part of the revenue to dealers in and sellers of coffee mixing chicory with coffee, or to their having the same so mixed in their possession. Considerable quantities then began to be imported, and the consumption became extensive, on account of the comparatively high price of coffee. The Government then placed a duty on importation of £20 per ton on the root, and £56 per ton on the roasted or ground. On the 10th Oct., 1854, the duty was taken off; and now a duty of £6 per ton is proposed to be levied next year, both on foreign and British grown.

It is a strange fact that the consumption of coffee has not increased in this country, even with the reduction of duty. We consumed no more coffee last year than we did in 1849, and three million pounds less than in 1846, yet with a lower rate of duty and an increased population of about three millions. Whether the public taste does not run on coffee, or adulteration has any influence in checking consumption, we cannot definitively say. Certainly the number of coffee houses has largely increased; but tea must, we presume, be the favourite beverage; for we find that the consumption has risen in the same period of ten years from 50 millions to nearly 76½ million pounds. And yet the relative prices of the two dietetic substances are materially different. Belgium, with a population of about five millions, consumes as much coffee as we do, and the United States and North American Provinces six times as much. The production in the world is now in excess of the consumption, and the produce of Ceylon has to seek a foreign market, in consequence of the diminished demand in Great Britain.

The admixture of chicory has certainly not extended the sale of coffee, and it has been attended with no benefit to the poorer consumers, who pay nearly as much for chicory, or the mixture, as they would for low-priced coffees, which are infinitely superior in nourishment, and in their general effect upon the constitution. It may do for the Continent to artificially protect the chicory grower; but we, who have extensive coffee-producing colonies, need no such bounty.

VALUE OF AGRICULTURAL PAPERS.

It is surprising to see the indifference manifested by farmers generally in regard to the success of agricultural papers. One would naturally suppose that every individual who cultivates the soil, would be deeply interested in everything calculated to increase his knowledge in that calling by which he lives; but, strange to say, so far from this being the case, the majority of farmers do not even subscribe to an agricultural paper.

I am sure that this indifference arises mainly from a want of appreciating the benefits to be derived therefrom, and the very erroneous, but I am sorry to say, generally prevailing opinion, that "almost any man ought to know how to farm." If we talk to a doctor, a lawyer, or a merchant, on any agricultural subject, he will discourse with the greatest assurance, and ten to one if he does not set up his opinions in opposition to ours, and even offer his advice on some matters of importance; but let the farmer dispute the opinions of any of these worthies, and offer to advise *him* in *his* calling, and he will be filled with indignant surprise that a mere clod-hopper should pretend to know anything about a profession which he had never learned. Now I confess I can see no difference between one man offering his advice about selecting a stock, studying a brief, or making-up a prescription, without having learned how; and another man holding forth on the best method of fattening stock, or renovating old pastures, without having learned how either.

Now I think the main aim of an agricultural paper should be, to disseminate knowledge concerning the art, and to give the farmer a more exalted opinion of his own calling, for comparatively few men will take the trouble to acquire knowledge unless they think it will be of advantage to them. Let the farmer continue in the belief that he does not need book-learning—that his father got on very well without it, and why not he, and he will benefit very little by an agricultural paper, *even if he takes one.* But let him awake to the fact that his profession is the noblest in the world—one in which the brightest genius and most profound research may find ample scope, and he will be impelled to read and think, and will eagerly seek after and profit by anything that will throw light on his practice. This is the main advantage of an agricultural paper, first to awaken a spirit of inquiry, and then to feed it.

Surely no one will deny that more useful information can be obtained from a good agricultural monthly or weekly, than in any other way at the same cost and trouble, embracing as it does all subjects of interest to the farmer, and constituting a medium through which farmers may communicate their thoughts and experience to each other. Have we a valuable horse or cow that seems in an unthrifty condition, and we are at a loss to know the cause—or have we a piece of ground that we wish to prepare in the best possible way for the next year's crop, or a piece of waste land that we wish to reclaim—do we want information in regard to any operation we wish to perform, how eagerly do we seek the opinions of those who may have had experience in the matter, and sometimes put ourselves to considerable trouble and expense to obtain advice on the subject—while for 50 cents. a year we can get a monthly paper, or for 2 dols. a weekly, affording the opinions and practice of the ablest and most successful men in the country on all these subjects.

In view of these facts, let me request every man who aspires to be a tiller of the soil, to lend a helping hand to promote the common good by encouraging those who are labouring to elevate his calling. There are many good agricultural papers published, and at a surprisingly cheap rate. Now is the time to subscribe. At the commencement of the year lose no time, but subscribe without delay to at least one good paper devoted to your interest; and he must be either supremely wise, or hopelessly stupid, if he does not find it the best and most profitable investment he has made during the year.

GEO. ESSON, *Canada West.*

WOMEN AND FARMING.

What follows below is a portion of the remarks made by the Rev. A. L. Stone, of Boston, at the annual dinner of the Norfolk Agricultural Society, in September last. No man knows better than Colonel Wilder, the President of the Society, what kind of men to call around him on such occasions, and well was his careful attention to this point repaid; for at no similar gathering have we ever known so much said that was practical and encouraging, and at the same time so eloquent and beautiful.

President Wilder introduced his distinguished guest to the multitude before him, and after a few pleasant introductory remarks, Mr. S. said:

"It is a pleasant surprise to me to find the agricultural interest represented by so many of the gentle and more domestic sex; and yet their presence on such an occasion I believe to be in every respect legitimate and wholesome, for their proper connection with this interest is intimate and vital. The original description or definition of a wife is that she is a helpmeet to man. Just in what way, or in what variety of ways, this fitting help is to be rendered, that original document does not set forth. The practical answer exhibits its diversities so varied as never to repeat themselves. Sometimes this sphere of helpful fellowship is very much restricted, and again almost indefinitely broadened. The wife of the German farmer limits this sphere only with the boundaries of his estate. Her nursery is out of doors in the open field: its canopy is the leafy shade; its carpet the green turf or the soft brown mould. There her little ones roll, and tumble, and sleep all day, while she keeps even stroke with her husband in the day's toil. On a day's ride in the diligence through a pleasant portion of Bavaria, I amused myself by jotting down the occupation of a dozen or so of ladies, as I met them in succession. The first two were equipped with the deep unwieldy hoes of the country, and were hoeing potatoes on a hillside; the third was plodding along on the road, barefoot, bare-armed, &c., with a burden on her head that would have broken the back of a moderate-sized mule; the fourth and fifth were swinging scythes with the regular action of the practised farmer, one of them leading the procession and keeping well ahead. Of the succeeding three, one was raking hay, one was pitching, and one sat on the top of a load, loading, while the only man of the group was driving the oxen. The next four were attendants upon house masons, and were carrying bricks and mortar on their heads up tall ladders, with an ease of step and balance that argued them experts at their trade. I have seen women in that same country holding a plough, and in some instances assisting a dumb ally—I mean a four-legged one—to draw the same agricultural implement.

"I suppose that some of us should not exactly covet this style of female co-operation, even in the stress of harvest season. But the question occurred to me here, whether there were not some sort of co-operation the wives and daughters of our farmers could render their lords in that calling, and if so, what. Now, I take it, it is the desire of every true wife to have at least an intelligent sympathy with her husband's calling. There is here and there perhaps one sustaining the relation of a wife to whom it is enough to share her husband's revenue, leaving out his cares and toils as trifles not worthy her regard. There may be here and there a husband whose ambition is to keep his more delicate half in blissful ignorance of all his out-of-door work, whether ploughing or financiering. But I suppose the old-fashioned and better notion is that of reciprocal sympathy between these fellow-pilgrims.

"I never would marry a couple, if I knew it, who had any other idea of the tie, no matter what the fee might be. And perhaps I may be permitted to add, that with right views on this point, I am ready to join any number of couples together with a trifling pecuniary proviso.

"But if the sympathy of which I have spoken be an intelligent sympathy, it should take some pains to be informed. I believe that an agricultural literature—and we may say, with just exultation, that we have now an agricultural literature—is quite as healthful and stimulating a literature in the drawing-room as that which deals in fashion plates and love-sick heroines. I don't think it would be unwomanly, in short, for the wives and daughters of our farmers to be able to converse wisely and wittily upon agricultural topics, with their husbands and fathers, or with gentlemen visitors. Such a conversation might easily vindicate itself in contrast with the vapid frivolities making so much of the staple of drawing-room chat.

"It would do no harm either for these ladies to have a general familiarity with the out-of-door pursuits of those to whom they are thus allied, even if that were gained by an occasional walk afield, instead of a shopping excursion.

"A visit now and then to the stable and the farmyard might save the fair explorer from such a blunder as happened once to a metropolitan friend of mine of the same sex. Being in the country, and smitten deeply with rural tastes, it occurred to her one morning that it would be quite romantic to play milkmaid. So she took a pail and went forth, but not meeting with any great success in the operation, it was discovered that she had made a slight mistake in regard to the sex of the animal she waited upon.

"But let the ladies of our agricultural homes make those homes centres of intelligence, culture, and refinement. Let them feel and show a just and generous pride in the calling to which they are thus allied, and a disposition and an ability to vindicate its true honour as compared with any other; let them give their rejoicing and sympathetic presence on such occasions as this; let the younger rank of these ladies place their delicate, soft hands for life as readily in the large, brown hand of the practical farmer, as in the soft and whiter palm of a merchant's clerk or a professional aspirant."

The speaker said he could not look upon the farmer without regarding him as a heroic wrestler with nature. With him every season was a campaign, and every harvest a victory; and may God crown you all with a blessing, as you are already crowned with honours.

A sentiment in honour of the Judiciary was responded to by Judge Rockwell, of the Superior Court.—New England Farmer.

VITALITY OF EGGS DESTROYED ON RAILROADS.—It does not appear to be so generally known as it should be, that railroad transportation destroys the vitality of eggs. Pack them as you will, if they are carried any considerable distance, say one hundred miles, the continual shaking will shake life out of them. Travelling on the Haarlem Road the other day, we met an acquaintance carefully carrying a small basket in his hands. We remarked that he handled his basket as carefully as though he was carrying eggs. "And so I am," he replied, "I am taking them about one hundred miles to a friend, and will ensure every one to hatch out a chicken so far as transportation may affect them. But I learned this by experience. I had a lot sent up the road only twenty-five miles in the ordinary way, and did not get one chicken to fifty eggs, while out of another lot carried in my hands in this way not one missed." As a general rule it may be set down for a fact, that eggs which have been transported by railroad will never bring forth chickens. This is important information, and should be well remembered. So, too, let it be remembered that eggs intended for incubation cannot be too carefully handled in taking them from their nests, and keeping them about the house till the hen is ready to take them in charge.—American Paper.

THE RECENT RAINFALL.

Drip, drip, drip. Never has so much rain fallen these four years past as we have had this winter. The umbrella, goloshe, and mackintosh manufacturers are perfectly jubilant. Far otherwise, however, fares with those in the country, who, with their hands in their pockets, flatten their noses against the window panes, or pace the house impatiently, to the misery of the inmates generally, and themselves in particular, thinking of their flooded fields and the pitiable condition of their sheep folded on turnips. Much-enduring brother, I sympathise with thee in this vision of unmitigated ruin.

Returning the other day, dripping wet, from a long visit of inspection, rendered difficult and irritating by reason of the continued rain, I began to cogitate by the fire, after having changed my clothes, concerning the true effect of these perverse showers, and sure enough I found this laudable intention produced its own efficient reward. My discontent vanished as I discovered the secret influence of the rain upon my own land, and I dreamed that night that the little drops of rain were changed in colour—they were yellow—and upon closer inspection I found that a golden rain had fallen to enrich me.

It is well that we should thus scrutinize those dispensations that we consider afflictive, for nine times out of ten we should find them friends in disguise.

Well, then, what is this rain, and what good does it do? Rain is the return to the earth, in condensed drops, of the aqueous vapours which are raised in the atmosphere by the sun and wind; this condensation being occasioned by a change in the general temperature, by a collision produced by contrary currents, or by a cloud passing into a cold stratum of air. Water expands and rarifies by heat. The quantity of vapour which the air is capable of receiving and supporting is regulated by its heat. Hot air will hold more vapour than cold; and when air, saturated with vapour, is cooled, it causes the vapour it contains to contract, and be precipitated either in rain or mist. Thus earth is supplied with moisture; and air, released of a portion of its charge, is prepared for the reception of a fresh supply in the shape of exhalation. Here are, then, two operations for us to consider:—1st. The air supplied with vapour. 2nd. The earth supplied with moisture.

We have all read of the sirocco, a periodical wind which blows every year in Italy and Dalmatia, from the south, about Easter time, and continues twenty days. This wind is described as peculiarly prejudicial to animal and vegetable life, producing great lassitude in the one, and burning up the sap in the other. The simoom, which prevails at certain seasons over the Great Desert of Africa, and is dreaded by the Arab and his camel, being fatal to life if not carefully guarded against, is very much of the same character. Now, we do not know what air really would be without vapour; but I imagine it would be something analagous in its effects to these destructive winds, which in passing over the arid plains of the East lose all their moisture, and thus blast the life they are intended to sustain. From this cause many tracts of country are uninhabitable. There is now three times as much water as land to compose the surface of this globe, and this proportion leaves many regions very spare of moisture. Had water and land been in the relation of 2 to 2, much land that is now habitable would not have been so, simply because the area from which evaporation would in that case have proceeded would have been too small to give the proper supply of vapour to the air, men would have perished with a parching thirst and a shrivelled skin, and vegetation would have been burnt up. Of two gases, the one exciting life and quickening combustion, the other highly inflammable, thus chemically combined, are formed a ponderable liquid named water, which evaporating passes as vapour into the air, extending a softening quenching influence through all organic nature. Seeing that vegetable and animal existence depends upon the presence of a requisite amount of moisture in the air we breathe, we will pass to the second consideration.

The effects produced by the rains as they descend through the earth are very various, and require to be noticed separately.

I take it of course for granted that the rains do pass through the open pores of our soils, and are let off through the drains at some 36 or 48 inches from the surface, into the ditches, after having fulfilled their mission of fertilization. Should the land, however, be what is generally termed "heavy and undrained," the rain will generally run over the surface, dissolving and carrying away whatever of value it may meet with, to the nearest ditch. This process of course impoverishes the land, and of course farmers occupying land under such circumstances are low-spirited in proportion as the clouds form, and seem determined upon a wet night. These gentlemen have, of course, made up their mind to expend more money in working their stiff soils; they are content to deal in naked fallows; they think a late seed-time, and a late harvest, and a worse quality of produce, better than the reverse, and are not at all careful to perform their quota towards improving the climate generally; and, with respect to this last point, I beg them to remember that the soil being thoroughly saturated with water, what is left must be carried off by evaporation; and, as every gallon of water thus carried off by evaporation requires as much heat as would raise five-and-a-half gallons from the freezing to the boiling point, the warmth abstracted from the atmosphere and from the soil is very considerable. A writer in the "Quarterly Review" states that 1 lb. of water evaporated from 1,000 lbs. of soil will reduce the temperature of the whole 10°. Supposing the individual in question indifferent to such showing, I pass on to notice then those benefits that drained soils derive from rain.

We have come recently to attach very much importance to the admission of air to our upper and subsoil. It fertilizes the earths, and feeds the roots of the plants. Mechanically and chemically it is essentially necessary to vegetation that the air should descend to the root, as well as play about the breathing leaves of the plant. Well, the rain finding its way down through the subsoil to the drain is followed by the air, and every shower of rain expels the old supply, and makes way for a new one, bearing with it nourishment and warmth. This is one benefit.

The rain, in falling through an atmosphere of temperature higher than that of the earth, carries warmth with it to the depth of the drains, should the descent be copious. The writer, in the Review I have just quoted, further states: "The temperature of the ground three feet below the surface, in England, is rarely more than 46 to 48 deg.; and hence rain falling during summer, often of a temperature of 60 to 70 deg., raises the temperature of the soil as it filters through it to the drains; and this is, doubtless, one reason of the fact I have often proved, of the higher temperature of the soil in drained than in undrained land." Here is a second benefit.

The rain, in falling on the heated surface of the earth in summer, conducts some portion of this heat downwards, and so equalizes its temperature. This, though a benefit, is not particularly *à propos* just now.

Johnston tells us that the rain carries down soluble substances to the roots of plants. I would add to this, that it not only carries them down, but perfectly distributes them; and here I indicate, without stopping to discuss it, a third benefit.

In red-coloured soils and some others, there are substances which collect from time to time, injurious to the roots of plants. These the descending rains, like a vigilant police force, bid to move off, and disperse through the drains, retaining some of the most hopeful for purposes of reformation. We have here a fourth benefit.

Lastly, the falling rains bring with them fertilizing substances from the air.

Various are the exhalations sent up as vapour from the earth's surface. The sea sends up a portion of its common salt, &c., and the land numberless forms of volatile matter arising from decaying matter; and these, instead of being allowed to pollute the air, are dissolved, and brought again to the earth; so that the rains thus purify the air, bear moisture to parched vegetation, and organic nourishment to its roots, &c.

Having thus indicated the heads of the consideration which gave peace to me, it only remains for me to say that, next morning, I found a new pleasure in observing the water pour from the eyes of my drains, and determined to act upon the opinion expressed by one of the fathers of modern drainage, who was heard to say, while watching the success of an experimental cut, "Varrily I do believe the whole arth should be drained!"

Nor was I disconcerted by the thought that, probably, much more rain must fall before the equilibrium is restored.* During the last four years we have lost 25 inches, or one entire year's fall; and if the same amount of rain falls every seven years, we need not expect to throw away our umbrellas just at present, though, every now-and-then, a bright, unclouded sky does to the sanguine portend an eternity of fine weather, and an early peck of March-dust.

F. R. S.

ON COMPOST AND VEGETABLE EARTH.

BY M. BOUSSINGAULT.

[TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE."]

In rural operations, of whatever importance they may be, a spot of ground is reserved, on which are accumulated the sweepings of the yard and granary, the mud scraped on the highways, the weeds collected round the dwellings, dead leaves, mould from the bottoms of ditches, turf gathered in dressing the meadows, rubbish from ruined buildings, ashes from peat, coal, and wood ley, the ligneous stalks of colza and Jerusalem artichokes, the residue of distillations of apples and grapes; in a word, this reserved spot is a receptacle, a common sewer, into which is accumulated everything that does not go upon the dung-hill. A constant moisture is maintained in the mass of rubbish by drenching it with the washings from the house, urine, or, in their absence, water.

At the end of a year or two, the compost is ready. Its appearance, as may be supposed, is as variable as the materials of which it is composed. Generally it is of a deep brown colour, and friable enough to be immediately spread over a meadow, where it will at once produce the most beneficial effects, because it renews and moulds up, as well as acts as a powerful manure. It is beyond a doubt the most economic pulverescent compost for top-dressing, when not required to be transported to long distances. The brick rubbish, sweepings, mud, ditch earth, old sward ashes, &c., must serve as the foundation of the compost; I have always done so with them, as being earthy matters, useful to vegetation, but containing very few organic substances. But that we should add to them the weeds, straw, residue of fruit, and, as is frequently practised, the refuse of the butchery, dead animals, blood, urine, &c., is what I have long considered as eminently disadvantageous, and founded on a principle too absolute perhaps, that everything susceptible of putrefaction should be thrown into the dung-pit. As to the privies, it seems to me that when it is intended for the improvement of a meadow, it is preferable to spread it directly as a liquid manure, rather than sprinkle it over an enormous mass of rubbish, in which it must lose in time a great part of its fertilizing principles, chiefly soluble and volatile.

For twenty-five years I have reflected in this respect, upon what is practised on the farm; but during that time have taken no steps, first, because the results obtained were most satisfactory, and next, because I considered that on a point essentially practical, on an operation, the efficacy of which was confirmed by the experience of a century, the opinion of a whole peasantry was of more value than that of a single academician.

From the time of my investigation on vegetable earths, which by revealing to me the importance of the phenomenon of nitrification in culture, had proved to me the analogy existing between a nitrate and a soil manured and strongly dressed with lime or marl, I began to think that there was no reason to regret the wreck of vegetables, the purin which we introduce into the composition of compost; and it became evident to me the hundreds of cubic inches of earthy matters mixed with organic substances that I had before my eyes constituted a true nitrate, that they differed in nothing from it, unless it be in some imperfections of the details in the management. In order to show my convictions in this respect, it will suffice, I think, to call over some of the precepts, contained in the instructions on the manufacture of nitre, published in 1777, by the stewards general of gunpowder and saltpetre.

"All earth is proper for the manufacture of saltpetre, provided it is not too compact, or too sandy. The earths procured from stables, cellars, ruins, &c., have the preference, the ooze from ponds, street mud, &c."

"Collect under a shed in which we would form a nitre bed, from 12,000 to 15,000 cubic feet of earth: add to it rotten dung, plants, leaves of trees, residue of grasses, scrapings of houses."

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* I have just received intelligence from the Superintendent of the Kew Observatory, that the rainfall from the 1st October, 1859, to the 31st January, 1860, was 9.425 inches.

"Lay the mass on a slope, spreading over it irregularly straw and branches of trees. Keep up a constant humidity by sprinkling it with urine, dish-water, ley, and the drainings of the dung-heap."

It will be seen that the materials of an artificial nitre-bed and those of compost are completely identical. In the nitre-bed, the access of air is skilfully managed by a system of hurdles, or by a uniform distribution of faggots disposed in parallel strata. In the compost heaps, the straw and leaves greatly favour the airing of the interior of the mass, but thrown in at hazard they do not always produce the effect that might be expected. In a nitre-bed every precaution is taken to keep up a proper humidity, which is one of the most important conditions, and at the same time the most difficult to fulfil; too much humidity injures quite as much as too great a dryness. In the compost, the wettings have no regularity, and it may happen that the liquids do not penetrate deep enough; those channels are not formed by the help of which the air or the water, at the will of the manufacturer, flows into the interior of the mass.

The nitre-bed is sheltered under a spacious shed surrounded with hurdles, in order to break the violence of the wind, and modify the intensity of the cold. The compost, on the contrary, remains exposed to all the vicissitudes of the weather, to the sun which dries the surface, and the rains which draw off the soluble salts. The heap of compost on a farm is most certainly an artificial nitre-bed, but one badly managed, and badly established, for the very simple reason that we do not know that one of the elements most favourable to production is saltpetre.

There are localities where the filth is subjected to nitrification before being employed as manure. In the Department of the "Nord" the farmers of the environs of Bergues transport in barges, to many leagues' distance, the gatherings and the mud purchased in the city of Dunkirk, in order to mix them, in alternate layers, with marl, chalk, and earth. The matters thus stratified remain on the bed for two years before being taken to the fields.*

It is by forming heaps with the leaves of trees and annual plants gathered from the soil after their maturity, weeds hoed up whose roots have still earth attached to them, that we obtain the compost for our gardens. It is difficult to avoid the conviction that these mixtures are nitre-beds. The compost, therefore, contains saltpetre; at least I have found it in those which I have examined. The following is the result of many quantities:

Nitrates expressed in nitrate of potash in one kilogramme of compost dried in the air.

	Grains.
Compost of the farm of Bechelbronn	1.51
Compost of leaves of Bechelbronn	5.51
Compost of the farm Neunreiterhoff, near Haguenan..	0.85
Compost from a bed of a garden at Verrières	0.94
Compost of a kitchen-garden at Paris	1.07

These proportions are certainly weak enough, yet they are not so much below, as we might suppose, those assigned to the materials manufactured at the saltpetre works. According to Bauer, in the description he has left us of the nitre-beds of Sweden, the saltpetre extracted from one kilogramme of matter is

From 1.65 grains to 2.20 grains for earths of ordinary quality.

From 6.00 grains to 7.00 grains for the richest earths.

At Malta, according to Demasis, the calcareous nitrified earths, after having been mixed with one-fifth of wood ashes, produced per kilogramme 5.52 grains of saltpetre.

In the report of the Stewards-general of gunpowder, we find that in France, in some provinces, the kilogramme of materials naturally nitrified yield often only 1.20 grains of nitre; that in the most productive artificial nitre-beds, as that of Touraine, they extract from the kilogramme of soil:*

	Grains.	
Commonly	8.5	Nitre.
In nitre-beds perfectly formed	10.0	„
Exceptionally	30.0	† „

In the preparation of compost, nitrification is not the main object, and the measures we adopt are frequently very unfavourable. Thus, when local circumstances allow it, we overload with urine, night-soil, blood, &c., and that only a short time before the compost is spread over the meadows. This is a most defective plan in regard to the success of nitrification. Practice teaches us that in the quantity of animal matters intermixed, there is a limit which cannot be exceeded with impunity, and the very conclusive experiments communicated to the Academy by M. Peloaze prove that if these matters predominate, not only will they be unfavourable to nitrification, but that they even destroy the nitre already formed, by transforming the nitric acid into ammonia. The saltpetre works, therefore, suspend the use of them many months before the time fixed for the lixiviate. During this last period the moistening of the earths is only affected with water.

A short time after I had presented to the Academy my researches into the quantity of nitrates contained in the earth and the waters, an English agriculturist of the first character advised the cultivators to establish artificial nitre-beds. I will not go so far as that. Although my conviction of the utility of saltpetre in the fertilization of the soil is very profound, I shall limit myself to proposing that in the compounding of composts, whether for the farm, the kitchen-garden, or the flower-garden, we follow, so far as circumstances will permit, the prescriptions recommended for the establishment and management of a nitre-bed. For this object I have placed at the end of my memoir an extract, which I shall not repeat here, from the instruction, so remarkable, for which we are indebted to the former stewards-general of gunpowder and saltpetre.

Let us now examine the utility of the nitrification accomplished in the compost.

The efficacious matter contained in a pulverulent manure, spread over a high meadow, will penetrate into the soil only after having been dissolved by rain or dew, and if these media are wanting they will remain exposed to the winds and sun. Let us admit that the fertilizing azotous elements are carbonate of ammonia,

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* Cordier, Agriculture de la Flandre, p. 215.

* The natural nitre-beds furnish materials much richer according to John Daivy in the Oura and Bengal:

	Grains Nitre.
The earth extracted from the Cave of Memora will contain per kilogramme	31.0
The earth from the Cave of Oura	68.0
The nitrate earth from the district of Tirhoot (Bengal)	120.0

It is remarkable that these nitrified earths are taken from the sides of caverns that the Indians scrape in a manner with a kind of small hatchets; they work thus only on the surface of the rock, where the saltpetre accumulates in efflorescence. The richness, therefore, as stated, must not be applied to the mass of the earth.

† In order to convert the weights and volumes indicated in the old memoirr, into present weights and measures, I have taken 38 kilogrammes for the weight of the cubic foot of earth, and 500 grammes for the equivalent of the pound.

or ammoniacal fixed salts, susceptible of being converted into carbonate volatile on contact with the calcareous matter which the earth in common contains, the deficiency occasioned by volatilization of the ammonia will become considerable. These fixed salts by their nature will remain on the surface of the meadow without sustaining the least loss, until the rain causes them to penetrate into the soil after having dissolved them.

It therefore appears to me that nitrification has the effect of giving to the fertilizing azotous principles of the compost a stability they would not have possessed if they assumed or preserved the constitution of ammonia.

If we consider that the nitrates form at most only 1-200th of the compost, we are led to ask if it would not be more economic to apply directly to the meadows the Peruvian saltpetre, rather than obtain the nitrate acid in an enormous mass of materials, the transport of which exacts from the teams a great expense of power. The American nitrate of soda, costing 50 francs per 100 kilogrammes, by adding to it 500 grammes, having a value of 25 to 100 kilogrammes of any kind of earth, we shall obtain in the form of nitric acid, but in that formation, the equivalent of a quintal (1 cwt.) of the richest compost.

That we may derive, even in Europe, great advantages in the form of improvements from the Peruvian saltpetre mixed with the slime of rivers or the scourings of ditches, employed generally in the dressing of meadows, is incontestible: the experiments of M. Kuhlmann and Mr. Pusey leave no doubt upon that point. In the meantime, a simple addition of saltpetre to mould cannot constitute a true compost, the efficacy of which depends also on phosphates and other substances, alkaline and calcareous, brought by the materials of which it is composed.

Nitrification, wherever it manifests itself, follows at first a progressive course, the rapidity of which in the compost I should have wished to state, but I have been prevented by the difficulty of deducting samples representing even approximately the mean constitution of so considerable a mass composed of elements so different and so unequally distributed. I have limited myself to making the investigation on a well-manured soil, that of the kitchen-garden of Liebfrauenburg, sufficiently homogenous when we have separated from it the straw and stones.

Ten kilogrammes of earth well damped were laid prismatically on a sand-stone flag, and sheltered by a glass-covering. When it was judged necessary, it was sprinkled with distilled water free from ammonia.

The day on which I began the experiment the earth had been perfectly mixed, and we had taken from it 500 grammes in which we had dosed the nitric acid. We had dosed several similar parcels between the 6th August and the 2nd October. The following are the results of these doses, the litre of dry and subsided earth weighing 1 kilo. 300:

NITRATES EXPRESSED BY NITRATE OF POTASH DOSED IN DRY EARTH.

	In 500 Grammes. Grammes.	Per cubic metre. Grammes.
5th August, 1857	0.0048	12.5
17th „ „	0.0314	81.6
2nd Sept., „	0.0898	233.5
17th „ „	0.1078	280.3
2nd Oct., „	0.1033	268.6

From the 5th August to the 17th September, in 43 days the production of nitre made rapid progress. The quantity of saltpetre rose from 12.05 grammes, when the little nitre-bed was established, to 280.03 grammes. From the 17th September to the 2nd October, the nitrification remained stationary.

At first sight the equivalent of 200 grammes of nitrate of potash diffused in a cubic metre of earth will appear a very feeble dose of azotous manure. But, in reality, the earth is only the excipient of the fertilizing principles; it is therefore in the water by which it is penetrated that, most generally at least, reside the agents destined to interpose in culture. Now, 100 parts of the soil of Liebfrauenberg absorb, when completely saturated and without changing its volume, 12 parts of water, say 546 kilogrammes per cubic metre. Every litre of water absorbed will contain therefore the equivalent of 0.512 grammes of nitrate of potash. Arable land is still sufficiently moistened when it retains no more than half the water it is capable of absorbing: being then more accessible to the air, it becomes more favourable to vegetation. In that state every litre of water will contain 1.024 grammes of nitrate, representing 0.172 grammes of ammonia, 0.141 grammes of assimilable azote, the germ of about 1 gramme of the proteous matter, the dry vegetable meat that the plant is capable of organizing.

I have already said that the compost owes not its fertilizing properties to saltpetre alone. I have thought that in order to complete the investigation it would be proper to seek for the azote and the carbon, the phosphoric acid and the ammonia, as I had already done with the vegetable earth, for these are the actual or approximate elements of fecundity.

The compost of the market-gardeners of Paris, which I have more closely examined, is the result of the slow decomposition of dung operated in the beds, established to determine that vegetation as precarious as vigorous, which is the true type of the most intense culture that it is possible for man to practice.

In order to form a hot-bed, we cover the soil with a dressing of horse-dung, of 1 m. 40 wide, and 0 m. 30 thick: we then water and press it strongly. Upon this basis we depose the bed of earth from 0.15 to 0.18 deep, more or less, completed by previous preparation, in which the plants develope themselves.

When we take away the hot-bed, the dung that constitutes the base is converted into an incomplete compost. This is a new earth, very porous, which we leave to acquire age by laying in heaps. There it subsides, becomes more dense, more homogeneous, more earthy; it is in this state that we form of it the upper stratum, the cultivable soil of a new hot-bed.

The compost obtained in one year not being employed entirely in the formation of the hot-beds of the succeeding year, there always remains an excess that the market-gardeners sell for top-dressing the lawns of pleasure-grounds.

I have examined two specimens of compost, one having been exposed on a heap for four or five months belonging to a market gardener; the other a new compost taken from a hot-bed of a garden belonging to M. Vilmorin. The first was dosed with dry matter the equivalent of 1.071 grams. of nitrate of potash per kilogramme; in the second, the equivalent of 0.940 grams. of the same salt. With the magnifying-glass we perceived in these composts fragments of quartz, very limpid and colourless, small calcareous nodules, detritus of vegetables more or less marred, having a brown tint acquired from the peat. The compost has otherwise much analogy with vegetable earth, as it is easy to satisfy ourselves by comparing its composition with those of different earths.

1st. The mould of a kitchen-garden at Bischwiller, near Haguenan: soil sandy, strongly manured.

2nd. The light mould of the kitchen-garden of Liebfrauenberg.

3rd. A very argillaceous earth, very strong, from Bechelbronn, taken in autumn in a soil where wheat had been harvested.

IN A KILOGRAMME OF MATTER DRIED IN THE AIR:

	Market-gardeners.	From Verviers.	From Bischwilier.	From Liebfrauenberg.	From Bechelbronn.
	Gram.	Gram.	Gram.	Gram.	Gram.
Azote entering into the composition of organic matters..	10.503	5.281	2·951	2.594	1.397
Ammonia quite formed........	0.118	0.084	0 020	0.020	0.009
Nitrates, equivalent to nitrate of potash	1.074	0.940	1.526	0.175	0.015
Phosphoric acid .	12 800	5.424	5.536	3.120	1.425
Lime	63 006	11.280	32.030	5.516	20.914
Carbon belonging to organic matters	99.400	66.422	28.770	24.300	11.590

We find, in fact, that the compost and vegetable mould taken in situations sufficiently various, present, notwithstanding, in their constitution, the same active principles, and that the real difference lies only in their properties. Thus it appears that a fertile earth may be represented by compost disseminated with a quantity, more or less strong, of a mineral basis, whether argillaceous, calcareous, or siliceous. If, for example, we add 4 kilogrammes of sand taken from the sandstone of the Vosges to 1 kilogramme of the market-gardeners' compost near Paris, we shall obtain a mixture approaching in its aspect and composition the vegetable mould of Liebfrauenberg, and differing from it certainly less than the latter differs from the mould of Bischeviller, of which, however, the sandy basis possesses the same nature and origin.

In one kilogramme there was of

	Grammes.
Azote entering into the composition of organic matters	2.101
Ammonia perfectly formed	0.024
Nitrate, expressed by nitrate of potash....	0.212
Phosphoric acid	2.560
Lime	12.600
Carbon belonging to organic substances ..	19.800

A happy circumstance has furnished me with an opportunity of extending my investigations to vegetable earths, which M. Le Gendre Déclay, a zealous traveller, had reported on the shores of the Amazons, and its principal tributaries. The six samples put into my hand represented the compost or ooze of the shores of the Rio Madeira, the Rio Topajo, the Rio Trombetto, the Rio Cupari, and the Rio Negro, whose waters uniting themselves to those of the Casiquiare, establish the junction of the two greatest rivers of the New World, the Oronoco and the Amazons; a communication so astonishing that geographers have doubted its reality until the memorable exploration of Alexander von Humboldt.

The Earth from the shores of the Rio Madeira.—Argillaceous; very plastic; bluish grey, enclosing *debris* of radicles; does not effervesce with acids; forests; culture, tobacco and sugar-cane.

The Earth taken at the embouchure of the Rio Trombetto in the Amazons.—Very argillaceous; a clear brown; makes no effervescence; forests; culture, tropical.

The Earth taken from the embouchure of the Rio Negro in the Amazons.—Furnished by a yellow sand, very loose; alluvium, having its origin in the granitic mountains of Guiana; does not effervesce; a steppe clothed with herbaceous vegetation.

The Earth taken from the shores of Lake Saracca, near the Amazon.—Mixture of clay and sand; a deep brown, interspersed with *debris* of roots; makes no effervescence. The deposit forms on the shore a cliff of from 80 to 100 metres thickness. The sample has been taken from land cultivated with tropical plants.

The Earth from the plateau of Santarem, elevated from 200 *to* 300 *metres above the Amazons.*—Mixture of sand and clay, almost black; abundant *debris* of vegetable matter, having sometimes the appearance of fossil wood; makes no effervescence; soil very fertile; rich culture of cocoa trees.

The Earth taken from the shores of the Rio Cupari, at the point of junction with the Rio Topajo, is the most remarkable for its constitution and extraordinary fertility. It forms a bank, one or two metres thick, arising from the superposition of alternate strata of sand and leaves, often well preserved, of a deep brown. It becomes entirely disintegrated, and then the sand is easily separated by the sieve. From 100 parts we took—

Sand	60
Decayed leaves	40
	100

The soil of Cupari must be considered as a deposit of compost of leaves, the extent and power of which explains at once both the vigorous vegetation and the formidable insalubrity of that hot and humid locality. This natural compost exhibits the peculiarity of containing no trace of nitrates, whilst it is unusually rich in ammonia.

I have disposed the results of these experiments in a tabular form. In discussing them we cannot refrain from offering this observation—that the soils of Brazil, undoubtedly the most fertile we are acquainted with, are derived from Feldspathic rocks, and contain only a few thousandth parts of lime.

In a kilogramme of air-dried earth—

	Azote entering into the composition of organic matters.	Ammonia well formed.	Nitrate equivalent to nitrate of potash.
	Gramm.	Gramm.	Gramm.
Rio-Madeira	1.428	0.090	0.004
Rio-Trombetto	1.191	0 030	0.001
Rio-Negro	0.688	0.038	0.001
Amazons, near Lake Saracca	1.820	0.042	0.000
Amazons-Santarem....	6.490	0.083	0.011
Rio-Cupari (natural compost)	6.850	0.525	0.000

	Phosphoric acid.	Carbon belonging to organic matter.	Lime.
	Gramm.	Gramm.	Gramm.
Rio-Madeira	0.864	9.100	2.032
Rio-Trombetto	—	5.863	3.696
Rio-Negro	0.792	5.900	3.304
Amazons, near Lake Saracca	0.176	14.944	4.696
Amazons-Santarem....	0 288	71.585	15.640
Rio-Cupari (natural compost)	0.445	129.000	4.408

It appears from these researches that, in spite of origins, diversity of situations, on the borders of the Rhine, and in the valley of the Amazons—in soils superabundantly improved by European cultivation, and in alluviums deposited by the great rivers of the impenetrable forests of America—the vegetable earth contains always the same fertilizing principles, the same that we find in larger doses in compost, the spoils of what has vegetated and lived on the globe; ammonia, or nitric acid, the most ordinary of ammoniacal salts united to nitrates; phosphates mixed with alkaline and earthy salts; and constantly organic azotous matters, of which the carbon, given by analysis, is evidently the index, and in some sort the measure. Complex matters incompletely studied, to which, in the mean time, according to my experiments I recognize that singular property of producing, under certain influences acting in the normal conditions of arable land, nitric acid and ammonia, that is to say, the two combinations in which azote is assimilable by plants. BOUSSINGAULT,

(Member of the Academy of Science, and of
the Imperial and Central Society
of Agriculture.)

THE EWE.—THE LAMBING SEASON.

It can never be out of time to bring this subject before the breeders of sheep, particularly when all are so anxiously looking forward to the lambing season. I say this, because I have for several years taken this liberty in the columns of the *Mark Lane Express;* and to me it does seem to require an apology for again and again recurring to it, as nothing new can be said upon it. It is too true, however, that the great bulk of mankind require to be reminded of mere common truths and common practices, even in the most ordinary things. I shall, therefore, again trespass a little upon the patience of my readers, with a few common observations and directions.

Before doing so, however, I would make a few remarks upon a subject I mooted a few weeks ago—*i. e.,* "*Will the ewe breed twice in the year?*" I have to thank those gentlemen who have so kindly and promptly contributed information upon it, and which, as known facts, are very valuable of their kind. I did not ask "if it could be profitably done!" but I wished to ascertain a few plain facts as to its actually being accomplished within a limited period, and with what results. These have been satisfactorily furnished by the several correspondents of the *Mark Lane Express,* and from which I gather that it is easily to be done, but not with such beneficial results as might be anticipated. Well, then, herein lies the difficulty: *Can it be profitably done?* I am not in a position to answer this question. My aim is to promote inquiry, and, if possible, to prove this to be a very fact. If we look at what has been accomplished in almost every department of business, be it in agriculture, manufactures, chemistry, mechanical science, steam appliances, or, indeed, taking in the whole field and scope of scientific research, we are struck with astonishment and wonder to find what the skill and industry of man has discovered and brought into full and effective usefulness.

From this, we may rest assured that the care and skill of the breeder of sheep would, in this instance, ultimately discover a process or means whereby this double crop of lambs may be turned to profitable account. For my own part, I must confess, I see no great difficulty in it; and I would suggest that a goodly number of breeders would judiciously undertake the experiment, each according to his own view of the case, and carry it out in the most liberal and best manner he can devise; each breeder to try with ewes of his own flock, so that the different breeds may be thus proved; the result to be from time to time given to the public through the columns of the *Mark Lane Express* and other papers. I certainly propose being one of that number, upon a small scale; for I would by no means counsel going extensively into it. My intention is, to commence with about a score ewes of different ages. The flock being large "longwools," and not very prolific breeders, I consider my prospects of success to be very doubtful. My predilection is in favour of the light-woolled breeds for this purpose, as they are generally better sucklers, and produce also more lambs. The Hampshire or Shropshire Downs are, I think, to be preferred for this experiment; but, as it is an experiment, all our popular breeds should be called upon to test it, and thus prove their adaptation.

The course I shall pursue is this: My ewes have just commenced lambing. Ewes will generally take the ram at three weeks. By this time I shall select those I choose to experiment upon, and confine them in a paddock where the ram can have ready access to them. I shall feed them with mangolds, cut oat-sheaves, cake, and corn. They will have the run of my best pastures in the summer, and be well fed; and as soon as the lambs have become accustomed to the corn and cake, and are fairly grown, I shall wean them, taking care to keep them in the best way I possibly can, to prepare them for wintering.

The ewe will thus have time to dry up her milk, and have a rest, to prepare for the next *lambing season,* which, I calculate, would fall in August and September. These lambs I prefer preparing for the butcher—*i. e.,* "fat lamb"—as they would not gain strength enough to abide our severe winters unless they were housed, and which might ultimately be adopted, in preference to fatting them. The ewe, to accomplish this, would require the best and most nutritious food; in fact, the favourable result of the experiment rests solely upon management—upon management yet to be developed, but which, I doubt not, the tact, care, and skill of the British farmer will successfully achieve. The ewe, at her three weeks' end, will probably take the ram again, when, of course, she again becomes a part of my regular flock, after having reared one lamb, and having another at her foot.

I am not very sanguine as to the result of these experiments; and I have no doubt the question itself will meet with its full share of ridicule. Still, the thing is worth trying. Something must be done. Population is vastly on the increase; the whole fully employed. Sheep, on the contrary, are decreasing. Mutton and wool are at prices never heard of in times of peace—an evident scarcity. Graziers and breeders have done much to cause this, by fatting the lamb and the dam the same season. Here, then, is one way of increasing the number by breeding; and I think it a poor compliment to our modern agriculture, if, amidst all its research, it cannot discover a mode of profitably accomplishing this desideratum.

But to the lambing season. I have so often given directions, in the *Mark Lane Express,* relative to the management of ewes in the lambing season, in detail, that I must now barely give an outline of the principal:

1st, I take it for granted that the flock has been properly kept, and prepared for the season.

2nd, Prepare the lambing-field with a sufficient number of temporary pens and shelters, warm and dry.

3rd, Prepare a dry, warm lambing paddock or enclosure for the flock and for the shepherd's convenience at night.

4th, Give the shepherd a phial of laudanum, a phial of gin, a bit of cord, and a small, long hook.

5th, Keep the lambing paddock clean, dry, and free from every taint likely to cause infection of any kind.

6th, Let the ewes be fed with great regularity, and on the same food—no changes—roots, corn, cake, straw, &c.

7th, Do not permit dogs or strangers to be amongst the flock at this season. Nothing like quiet.

8th, Direct the shepherd to devote his whole time to the ewe-flock, and to be constantly with them.

9th, When a ewe makes a presentation, she must be examined in due time. If all right, give her plenty of time. If the labour becomes prolonged, let the shepherd take the lamb away—*i. e.*, lay the ewe gently on her side, take hold of the feet of the lamb, and gently draw it forward. If a wrong presentation takes place, the shepherd must take his little hook or his finger, insert it, and draw forward the foot, head, &c. The cord is to place on the foot, &c., to prevent its being drawn in, to undergo fresh pain in bringing it forward. He must, with great care, draw forward such parts as he can lay hold of, and use his best judgment as to his course in completing the delivery. It is a most dangerous practice to push back the lamb, to be turned in the pouch of the dam.

10th, After a prolonged labour, give a small tablespoonful of laudanum to the ewe. Confine her in a warm lambing-pen. In a few hours give her a pint-possett of milk, sweetened with treacle.

11th, If fever intervenes, give her two ounces of castor-oil, and in a few hours half-an-ounce of *sweet* nitre; and continue the possett, or gruel made of flour and water, sweetened, and sweet spirits of nitre, as long as required.

12th, Let her food be simple and nutritious—not cold mangolds, turnips, or cabbage, but chaff and roots mixed.

13th, Never, except in the greatest extremity, use lambing-oils to the bearing, and then very mild ones.

14th, Separate the ewes and lambs from the general flock as soon as convenient, and take them to pastures or seeds properly laid-in and prepared for them.

15th, The lambs require great attention throughout. In protracted cases they are often dead or greatly hurt. Suckle them very slightly at first, but frequently: in their exhausted state, they cannot bear fatigue. Clear the ewe's udder of wool. See that they can and do freely suckle. Keep them warm and dry.

16th, When lambs are starved down, either warm them at the fire, holding their nostrils for an instant close to the warmth — lay them before it, under a slight cover; or give them a warm bath. A warm dungheap will suffice, if not too warm to breathe. A mouthful of warm gin and milk is good. Cows' new milk is mostly too strong for young lambs: dilute it.

Lastly, The master must be often there.

ALDERMAN MECHI'S AGRICULTURAL CATECHISM.

ESPECIALLY ADDRESSED TO HEAVY-LAND FARMERS.

I have received many letters from practical farmers desiring to know how I can pay myself a high rent, and make, besides, a satisfactory tenant's profit, at the present low prices of corn. I find, on inquiry, that many of those farmers are placed in an unfavourable and profitless condition, as compared with myself, for want of those improvements and advantages which I possess, and for which my increased rental is charged. In order that farmers may compare their own position with mine, I have propounded the following questions, which I have answered, and which each farmer can reply to, and thus compare his practice and position with mine:—

How much do you suppose the landlord's investment is per acre in the purchase and improvement of the land which you occupy?—About £60 per acre.

What rent do you pay per acre?—42s.

How much is your working capital per acre?—£14.

How much is your gross produce per acre. I mean the total amount received for produce sold, without any deduction of expenses?—£11 15s.

What are your total expenses per acre, including purchased food and manures, but irrespective of horse-keep, which I assume is furnished by the farm?—£9 11s. 8d.

GROSS EXPENSES PER ACRE ON THE WHOLE FARM.

		£	s.	d.
Rent	36s.	2	2	0
Irrigation	6s.			
Tithes (great and small)		0	5	0
Church rate		0	0	2
Road rate		0	0	3
Poor rate, including police and county rate		0	2	3
Manual labour, including engine-driver and bailiff		2	0	0
Horse labour (fed from the farm), 20s.				
Seed		0	8	6
Depreciation, or wear and tear of implements		0	2	0
Steam power		0	5	0
Blacksmith, wheelwright, cooper, founder, saddler, basket-maker, bricklayer, carpenter, and veterinary		0	5	6
Thatcher		0	1	0
Depreciation of horses		0	2	0
Artificial manures (guano)		0	10	0
Wear, tear, and loss of sacks		0	0	3
Bean tiers		0	0	3
Loss of stock and casualties		0	1	0
Loss of lands by roads, buildings, fences, and waste		0	2	0
Road mending, ditch cleaning, fence trimming, &c.		0	1	0
Miscellaneous petty expenses		0	1	6
Malt and hops used in brewing beer for men		0	2	0
Purchased food for stock		3	0	0
		£9	11	8

How much permanent grass have you per 100 acres?—4 acres.

Has your landlord drained the land?—Yes.

Has he put up farm buildings in a central part of the farm, affording ample covered shelter for live stock and manure, with tanks for economising liquid manure?—Yes.

Is there a good farmer's residence?—Yes.

Are there good roads on the farm?—Yes.

Is any portion irrigated by water and gravitation?—No.

Is any portion laid down with subterraneous iron pipes for irrigation with water and with farm sewage, by hose jet and steam power?—Yes, the whole farm.

Is there a fixed or portable steam-engine?—A fixed engine.

Does the steam-engine work a thrashing and dressing machine?—Yes.

A chaff-cutter?—Yes.

An oil-cake breaker?—Yes.

A pair of mill-stones?—Yes.

Irrigating pump?—Yes.

Sack-raising tackle ?—Yes.

A root pulper ?—Yes.

Are the buildings troughed ?—Yes.

Is the liquid manure allowed to run away ?—No.

Is your corn drilled ?—Yes.

Do you use Garrett's horse-hoe for your corn and root crops ?—Yes.

How much seed do you drill per acre ?—Wheat, 4 to 5 pecks; barley, 6 pecks; oats, 6 to 8 pecks; beans, 10 to 12 pecks.

Do you subsoil and trench-plough your land ?—Yes.

What is your depth of cultivation (measured on the solid side of the ploughed land) ?—12 inches, but it ought to be deeper.

Do you use a reaping machine ?—Yes.

How much has been your annual loss in horses and live stock per acre (in money value) the last seven years ?—1s. per acre per annum.

How many acres (landlord's measure) does each farm horse consume annually of the produce ?—2½.

How many working horses do you keep to each 100 acres ?—6 for 170 acres.

How much is your labour per acre per annum, including bailiff (if any) and engine driver ?—40s.

How much purchased manure do you use per acre over the whole farm ?—10s. worth.

How much purchased food per acre over the whole farm ?—£3 worth.

How many pounds of meat (net dead weight) do you make per acre over the whole farm ? I mean actual dead weight, added to the animals which you purchase ?—200lbs. per acre, or 34,000lbs. on 170 acres.

How many quarters of corn do you sell off the farm annually per acre ?—Average: Wheat 250 quarters, beans 100 quarters, oats and barley 150 quarters, from 170 acres, or 24 bushels per acre.

How much clover and grass-hay do you sell off annually ?—£100 worth.

How much dairy produce ditto ?—£70 worth.

How much clover seed, or other seeds ditto ?—This year about £70 worth.

How much of any other produce ditto ?—About £30 worth

Are your fences closely trimmed ?—Yes.

Or are they allowed to go untrimmed for several years ?—No.

How many acres per 100 of the farm are occupied by buildings, fences, roads, water courses, and waste ?—5 acres, or 5 per cent. of the land.

Are your drains and water courses free and open ?—Yes.

How many loads of burned clay ashes have been applied per acre ?—25 cart loads.

How much lime ?—About 80 bushels, or 240 bushels of chalk.

How many trees have you per acre ?—None.

Is much of your labour done as piece work ?—Yes.

Do you enter every money receipt and payment in the cash book, and take stock at the beginning and end of each year ?—Yes.

What profit do you make upon your farming capital ?—From 15 to 18 per cent.

Do you apply your house sewage to the soil ?—Yes.

Do you grind corn for your neighbours ?—Yes, and it pays well at 3s. per quarter.

Are your stock comfortably housed during the winter ?—Yes.

Are your green and root crops passed through the chaff cutters for your animals ?—Yes.

Are your animals permitted to walk, lie down, and dung upon their food ?—No.

Do you hold your land on lease or by annual tenure ?—I farm my own land, except a portion held on a 21 years' lease.

Do you use waggons or carts ?—Carts.

Are your corn stacks on iron rick frames ?—Yes.

Do you feed much of your straw ?—Yes.

I think it right to state that I consider the items of £3 per acre for purchased food, and 10s. per acre for guano, have a most important influence on my profit. Without these items, I should expect a very different balance-sheet. I also derive much benefit from applying the manure mixed with large quantities of water. In fact, every one of the questions I have propounded has, in a greater or less degree, an influence on the profits of farming; and it would be easy to come to a conclusion as to the success or failure of a farmer from the manner in which these questions would be answered. We can safely compete with the whole world in the production of corn, but that can only be done by a concurrent large production of meat and manure, the latter not purchased, but produced by the feeding of stock. My crop of wheat this year is immense. I thrashed, this week, a seven-acre field of wheat, which produced a large crop of wheat in 1857, a great crop of beans in 1858, and now, in 1859, the crop of wheat is nearly seven quarters per acre. This field was manured for beans in 1858, but had no manure of any kind for the wheat crop of 1859.

Those who have not experienced the advantage of drainage, very deep cultivation, and abundant manuring, have yet a great lesson to learn. I have good reason to believe that my 56 acres of wheat will produce more than 308 quarters, or 5½ quarters per acre, although 20 acres were taken without manure after a heavy crop of beans, 12 acres after mangel, 6 acres after wheat, 12 acres after Italian rye grass, 6 after clover.

My crops were seen, as usual, during their growth by many agriculturists from various parts of Britain, and from foreign countries.—*From a Paper read by* Mr. Mechi, *at the Society of Arts on Wednesday, March* 5.

HOW TO FATTEN CHICKENS.

It is hopeless to attempt to fatten chickens while they are at liberty. They must be put in a proper coop; and this, like most other poultry appurtenances, need not be expensive. To fatten twelve fowls, a coop must be three feet long, eighteen inches high, and eighteen inches deep, made entirely of bars. No part of it solid—neither top, side, nor bottom. Discretion must be used according to the sizes of the chickens put up. They do not want room; indeed, the closer they are the better, provided they can all stand up at the same time. Care must be taken to put up such as have been accustomed to be together, or they will fight. If one is quarrelsome, it is better to remove it at once, as, like other bad examples, it soon finds imitators. A diseased chicken should not be put up.

The food should be ground oats, and may either be put in a trough or on a flat board running along the front of the coop. It may be mixed with water or milk; the latter is better. It should be well slaked, forming a pulp as loose as can be, provided it does not run off the board. They must be well fed three or four times a day—the first time as soon after daybreak as possible or convenient, and then at intervals of four hours. Each meal should be as much and no more than they can eat up clean. When they have done feeding the board should be wiped, and some gravel may be spread. It causes them to feed and thrive.

After a fortnight of this treatment, you will have good fat fowls. If, however, there are but four to six to be fattened, they must not have so much room as though there were twelve. Nothing is easier than to allot them the proper space; it is only necessary to have two or three pieces of wood to pass between the bars, and form a partition. This may also serve when fowls are put up at different degrees of fatness. This requires attention, or fowls will not keep fat and healthy. As soon as the fowl is sufficiently fattened it must be killed, otherwise it will still get fat, but it will lose flesh. If fowls are intended for the market, of course they are or may be all fattened at once; but if for home consumption, it is better to put them up at such intervals as will suit the time when they are required for the table. When the time arrives for killing, whether they are meant for market or otherwise, they should be fasted, without food or water, for twelve or fifteen hours. This enables them to be kept some time after being killed, even in hot weather.—London Cottage Gardener.

THE TRADE IN HORSES FROM AUSTRALIA.

We called attention, not long since, to the trade in horses from the Cape colony to India, which had proved so beneficial to the Cape horse-breeders; and we would now bring forward a few facts respecting the progress of horse-breeding in Australia. These cannot but be interesting, as affording evidence of the relative numbers and progress of the horse kind in the several colonies, and the prospects of beneficial results to be derived from breeding for shipment to India and other quarters. By searching through the official statistical returns of the colonies, we find the following to have been the number of horses belonging to the several colonies—

	1855.	1856.	1857.
New South Wales......	158,159	168 929	180,053
Victoria	33,430	47,832	55,683
South Australia	—	22,260	26,220
Western Australia......	4,987	5,408	7,214
Tasmania..............	18,358	18,019	19,187
New Zealand	—	—	10,589

As the demand for horses for cavalry purposes in India is greatly increasing, the Government are wisely adopting more permanent measures to meet the supply, instead of resorting to the temporary and occasional purchases, which can seldom be successful. Our last Australian advices report that the Governor-General had received a despatch announcing the intention of the Queen's Government in India to form a permanent depôt for cavalry-horses, in a locale in the neighbourhood of Sydney, convenient for their ready shipment.

It is further notified that Colonel Atkinson is the officer appointed to take charge of the depôt. This gentleman accompanied Colonel Robbins to the Australian colonies when the pressing emergencies attendant on the mutiny of the sepoys rendered a large and speedy supply of troop-horses a desideratum, and the purchases which were made in many instances were considered disadvantageous by the military authorities at Calcutta. Colonel Atkinson himself perceived the unfavourable position in which he and Colonel Robbins were placed; having but indifferent means of selection, being compelled to make hasty purchases, and to contend with many difficult obstacles. Before he left Sydney, Colonel Atkinson expressed his intention, upon his return to India, to urge upon the Commander-in-chief the expediency of forming a permanent depôt near Port Jackson, where horses, purchased at favourable opportunities, might be depastured, broken in, and shipped at convenient intervals. He observed that on several occasions, when a horse-ship was on the eve of sailing, the full draught could only be completed by the purchase of inferior stock; whilst in a week or so after the sailing of the ship first-rate horses were offered for sale. When, some years ago, Captain Apperley formed a depôt at Bungarrabee, which is only twenty-three miles from Sydney, and where he purchased cavalry horses on account of the East India Company, he saw the great importance of a fixed and permanent station, and, in earnest terms, he endeavoured to impress upon the Company the inexpediency of breaking up the establishment. His remonstrances were made in vain; he and his brother-officers were recalled; and thus a most impolitic step was taken, bitterly, and too late regretted, when the mutiny throughout the native regiments assumed its formidable and frightful aspect. Profiting by the lamentable experience of the past, her Majesty's Government in India have now resolved to adopt the course unsuccessfully recommended by Captain Apperley some fourteen years ago, and again by Colonel Atkinson, on his recent return from New South Wales, and the latter officer was expected to arrive at Sydney by an early mail-steamship. This arrangement will be hailed with the highest satisfaction by the breeders of horse-stock in the Australian colonies.

During the last eleven years, the exports of horses from New South Wales have been steady, but certainly not of that extent which may now be anticipated. Previous to 1857, the official statistics did not distinguish the shipments to the different countries importing Australian horses, but the total number shipped during the nine previous years was as follows:—

1848	1,181	1853..........	907
1849	1,135	1854..........	1,179
1850	830	1855..........	1,282
1851	1,941	1856..........	1,948
1852	770		

Making a total of 11,173 horses, whilst since the latter date the exports are shown in a form to distinguish the shipments to India from those of other countries as follows:

	India.			Other Countries.	
	No. of horses.	Value in sterling.		No. of horses.	Value in sterling.
1857..	523	£6,410	..	5,600	£12,645
1858..	1,081	33,300	..	784	20,036
1859..	614	15,830	..	nil.	nil.
	2,218	£52,040		6,384	£32,681

Showing gross totals of 8,602 horses shipped, of the declared value in sterling of £85,721; figures which abundantly testify as to the capacity of New South Wales to supply the cavalry of the Indian army with any number of horses which the exigencies of the service may require.

In reference to the general export of horse stock seaward, from New South Wales, as shown above, we must also call attention to the large overland traffic between the colony and Victoria, viâ Albury, Belvoir, and other crossing places; and also between New South Wales and South Australia. The official returns of this traffic have lately been published, for the first time, in the Statistical Register of the Registrar-General. They show that during 1858 there were sent over the river Murray to Victoria 5,953 horses, and received back 577, making a net export of 5,376, valued at £107,520. To South Australia there were sent 812 horses, valued at £16,740; making a total sent overland, of 6,765 horses, less 577 imported from Victoria. In addition to these officially recorded exports, there is no doubt that horses have been taken across the borders at places where no records are kept; and Mr. Rolleston well observes that, considering the great extent of the frontier, and the want of proper officers to collect the information, it is more than probable that a considerable number has escaped detection. "Sufficient information, however" (remarks the *Sydney Herald*), "is given in these overland returns to show how large a development of the pastoral resources may be looked for by the opening up of water communication within our territory, to the extent of upwards of 2,000 miles, by way of the Murray and Murrumbidgee, and over 1,000 miles up the courses of the Edward and Darling Rivers, one of the most valuable features in the history of the colony, and promising results of the highest value, from the facilities of communication afforded by the navigation of these noble rivers. Next to India, New Zealand promises to be our best customer for horses, her enterprising settlers now devoting the most careful attention to the breeding of first class horses. In 1857 we exported to that colony 121 horses, valued at £2,715; and in 1858, 550 horses, valued at £12,975; thus showing totals of 671 horses, valued at £15,690. This export is, less 99 horses, equal to the total shipments of horses from the Port of Sydney in 1852, and speaks insignificant terms of the enterprise and prosperity of the sister-colony."

As regards prices, and general value of horses in the several Australian colonies, we have no very complete and reliable information. Indeed, it would be very difficult to obtain such; for the price, even of the same horse, would necessarily vary in different localities, either of town or country, according to demand and supply. In the official blue-book returns we find that the average price of a good saddle or light cart-horse, in South Australia, which in 1855 was £30, in 1857 was only £23. In New South Wales the average price was about £22 10s. in 1857, £30 in 1858, and £26 in 1859. In 1857 the price of horses ranged in Western Australia from £25 to £100; and the value of 66 shipped thence in that year to Singapore is returned at £1,782, or an average price of £27. In Tasmania, in 1856, horses were worth £30 to £35. In the New Zealand provinces, in 1857, horses sold from £20 to £80.

We are aware that sales of good horses have been made at considerable sacrifice, and that the market in New South Wales is at present much depressed; but renewed encouragement will now be given to those interested in a very important branch of the colony's produce; and we shall soon expect to see the exports of horses from Australia forming a very large item in the records of its increasing wealth. When we find that Col. Apperley recently spent about £300,000 in the Cape colony in the purchase of horses for the Government in India, we look for great benefit to New South Wales, and the other Australian colonies, by the expenditure arising from the purchase of horses, and the further stimulus given to the breeding of them. Looking at New South Wales—the principal colony for horses—we find that there has been an increase of 22,000 in two years in the colony, besides upwards of 9,000 exported. There is here, therefore, a very large field for purchasers, whether near or distant. The observations of Col. Apperley, recently made to the Cape farmers, are well worth reproducing here:—"It is to the horse-vendors," he observed, "that you are enabled to ride in your carriage with comfort, instead of, as formerly, having to take your wives behind you on a pillion. There is no article of agriculture that pays so well as good horse-breeding, particularly as the thousands of acres which men possess here can be made available for this purpose. Some farmers have continued to do very well at that, but with the thousands of pounds which I have spent among others, I am sorry to say they have decorated their drawing-rooms with pianos, and artificial flowers under glass-cases, without reflecting that that is not of any practical usefulness. If they go on doing that, they will not get any more Indian money they may depend on it. As a class, I must say they are good fellows. In all parts of the world I have dealt largely with them, blacks as well as whites, and I can honestly say that, in Australia, in India, Africa, or England, in all my transactions with them I have never had any differences. I never spent a shilling in litigation with them in all my life, neither for myself nor the Government. I never visited a horse-breeding establishment without being treated with liberality; and, in ninety-nine cases out of every hundred, I have never been asked what is not fair and reasonable. Having such dealings as that makes a man's work pleasant: and in this colony I hope to have still more dealings, and to see more importations of high-bred mares. It is said the Indian Government never patronized the colony except in a case of emergency. Well, they must have handsome horses, and if the farmers of the colony want to keep me here they must breed something better than they do. I will have great pleasure in remaining, and I will report all I can in their favour. I may here say that I have a capital pair of horses, which travelled the other day one hundred and twenty-five miles in a cart, and yet came into town fresh. Depend upon it, gentlemen, nothing can pay better than breeding good horses. I hope that my advice will be understood and appreciated." This is high authority, for the speaker is a son of the celebrated "Nimrod," the most successful writer on the horse this country has ever known.

THE BREEDING AND REARING OF PRIZE STOCK.

The degree of public notice drawn to Master Butterfly—on account of the honours which he brought to his owner, and the high price for which he was sold—can scarcely be greater than that which has recently been given to the announcement of his death. We recently extracted from the *Victoria Agricultural and Horticultural Gazette* some very forcible remarks upon the injuries which stock have received during the voyage from this country. Many serious losses have already arisen from this cause; and the last instance recorded is decidedly not the least important. It would appear that Master Butterfly never recovered from the effects of his voyage, for he suffered from a cold and husky cough soon after he landed; that he gradually lost condition, and seemed to decline from the effects of a pneumonic disease very similar to pulmonary consumption in the human frame. From further evidence given by the same *Gazette,* there is reason to believe that the imperfect ventilation of the box in which he was shipped contributed in a great degree to sow the seeds of a disease which subsequently terminated fatally.

The injurious tendency of any ill-ventilated apartment thus to engender disease is much too frequently experienced to have been overlooked even by general readers. That air which enters the lungs pure is returned again impure, and unfitted for discharging its duties a second time. It is unfit because it has lost its invigorating and purifying powers, and it is also unfit because it is contaminated with unhealthy matter. The respiration of such air is calculated to do much injury to the lungs; and in a shorter or longer period—varying with the animal's health and strength, or other ameliorating circumstances—we have a disease commencing upon the lungs, which renders them incompetent for the healthy discharge of their duties. There is, under the energy of vital action, a repelling action carried on in the lungs; and we therefore find an animal of delicate constitution becoming a more easy victim to disease than those possessing strong and vigorous habits of life. In the one case, the germ of disease localises itself upon an enfeebled organ possessing but little energy of life to resist the destructive agency; in the other case, the vigorous action of the part secures it from the influence of the disease, and its injurious and prejudicial action is thus negatived. Thus we observe that some animals have a predisposition to disease, which is not evident amongst others. We have seen instances of epidemic diseases occurring amongst stock—all under a similar mode of treatment —yet singling from amongst the herd or flock certain individuals, which, from a delicacy of constitution, becomes the more easy prey to the enemy.

In the instance of Master Butterfly, we have an animal nourished under the most favourable circumstances, and brought to a high degree of perfection by careful management and rich food; and yet these circumstances were amongst the secret causes which cooperated against the animal. The great advantages which are realized by careful breeding from parents of good pedigree are often accompanied by a delicacy of constitution, and this is generally more evident upon the lungs than any other part of the body. The ultimate object we have in view is to obtain an animal capable of producing fat and lean in the most economical manner, and consequently with the least waste of the materials of the food consumed; such an object requires that the lungs of the animal shall not only be reduced in size, but also in energy. This renders some of high-bred stock predisposed to diseases of the lungs. In like manner, by the high feeding which is adopted from the time of birth, the system is under a constant high pressure of growth, and every part of the body which administers to its development is called into active exercise; thus it is kept in a highly plethoric condition, which rather favours the progress of disease.

This rapid growth of the body, although it indicates an energy of the system, cannot be taken as evidence of natural vigour; for the modified circumstances and conditions of life are so thoroughly unnatural that it cannot produce this much-to-be desired result. If the animals were ranging at liberty with all the freedom enjoyed by its undomesticated ancestry, its growth would be of a very different but more natural character; and in such case the rapidity of its growth would be equalled by its vigour of constitution and freedom from disease. We cannot, however, secure the same disposition for health and resistance to disease when the habits of life and the general development of the body are so completely reversed. It is a necessary consequent of domestication that, in producing an animal of superior meat-forming powers, although we can thereby more economically change vegetable food into meat than by any other means, still there is an accompanying necessity for greater care and watchfulness on our part.

These circumstances lead us to consider how far the powers of the animal were adapted to contend against the attacks of disease, and certainly the changes in climate and the variations in temperature must have been exceedingly trying, with all the care taken during the voyage. Unfortunately, as yet, for the breeders of stock for our Colonies or the Continent, they cannot combine the two results which they know are desirable. If during the early growth of the animal it were kept under a less degree of protection, allowed to take more exercise, to seek shelter when it desired it, and at other times to have the option of greater exposure, we should no doubt secure such an animal with a stronger constitution, a more vigorous habit of body, and less liability to disease; in short, it would be more competent to contend with the difficulties and trials of a long sea voyage, the changes of climate, and be really a more valuable animal. On the other hand, such a beast would be inferior in its power of producing fat meat, and in any exhibition would be beaten by others which have been the subjects of a more pampered system. Thus the animal which would be really the most suitable for transmission—that, in fact, which would be most competent for the special duties required of it—would be prejudiced in its market value by reason of a preparation which confers upon it a decidedly greater practical value. So long as this paradox exists in the market, we cannot expect any modification of practice to be adopted, although indirect advantages might be realized thereby.

It is, however, necessary that the attention of breeders should be drawn to a consideration of the point. Any circumstances which prejudice the value of our high-bred stock for the foreign market must be guarded against as much as possible—whether it be the quality of the stock, or their powers of producing milk, or meat, or their liability to disease. Whatever detracts from their value to the buyer, must ultimately revert upon the seller individually, or on the home market generally. We know that stock in our own markets are very materially affected in value by want of sufficient exposure to render them hardy. In the Short-horn breed this is not so common as with Devons and Herefords, because the former class, especially if they are well bred, are reserved for warm, luxuriant, and favoured districts. In the Hereford and Devon breeds hardihood of constitution is much more necessary, and, consequently, their mode of wintering is carried out accordingly. Whilst shelter is offered, they have also considerable freedom of action, and they only avail themselves of shelter in the roughest weather. In this way we find them sent to market in April, and even in May, with their winter coats firm upon their backs, and they do not cast them until the warm weather of spring enable them to do it with safety.

But what is the advantage of retaining their rough coats so late? Ask it of those who have given too liberal shelter to their stock during the winter months, and consequently turn them out to grass in May with coats as beautifully smooth and glossy as can be imagined, and these will have to report that, after a few cold nights (for we are sure to get them, however beautiful the days may be), coughs are not uncommon; whilst the animals look pinched up as with cold, and certainly do not present a thriving appearance. If the stock are tolerably hardy, they regain, after a time, the condition thus lost, and again resume their appearance of health; but others with a natural predisposition to disease favour a more permanent suffering, and many instances of diseased lungs date from those changes of temperature to which the stock have been exposed; and of these pulmonary attacks, the larger proportion assume a similarity of character to that which has deprived us of a bull of which we were all justly proud. The breeders of first-class stock are not ignorant of these difficulties, and the choice which lies before them to produce the most valuable animal, either as may be indicated by its money value or its suitability to the foreign market. Ultimately these must approximate more closely than at present; but, in the interim, it is well to be reminded of the true position in which English breeders are placed, and to show—as we have endeavoured to do—that the permanency of the demand and the profits to be realized depend upon the real value of the stock produced, and their suitability for the purpose for which they were purchased.

THE WIRE FENCE.

In situations where appropriate, there is no artificial fence neater or more economical—considering first-cost of erection and length of efficiency—than wire strung on wooden posts. In special instances it may be used with advantage on the farm; but as a general farm-fence, especially on arable lands, it should be adopted with caution. Where shelter is a consideration it is objectionable, as it affords none; but as a strong, durable, and ornamental fence, it is now much used, and is deservedly popular within the parks and about the home-grounds of gentlemen's country seats. Wire fencing is erected various heights and strengths, varying from 3 feet, with 5 wires high—which is the lightest sort of fence and intended for sheep exclusively—to 6 ft., with 10 wires, which is used as a fence for deer.

The wire we see mostly in use for fencing is the whole or single strand wire, and, as had from the manufactory, is numbered according to its strength. There are various sizes of it, varying from that known as No. 4—measuring 3-12ths of an inch in diameter, and used in the strongest description of fence, as for horses, deer, &c.—to No. 8, which is 5-24ths of an inch diameter, which is the smallest sort, and used only for sheep or lambs. There is, however, another form manufactured for fencing, composed of several strands of wire twisted together, in the same manner as a cable rope, and galvanized or covered with zinc, to enable it, without any painting, to withstand atmospheric changes without corrosion; and which, both as regards utility and appearance, is to be preferred to the single wire. It sometimes happens that cattle put their heads between, or so press against the wires as to put them out of form, and in each case the single wire remains as pressed, presenting an unsightly and untidy appearance of fence, and which is rendered the more intolerable as it is probably adjoining or contiguous to the mansion. Such an occurrence never can take place with the cable form of wire, as it is so flexible and elastic that, however much twisted or pressed out of its line, whenever the pressure is removed it rebounds to it again. A cheap form of the last-mentioned wire may be got by purchasing in the colliery district their cast wire rope, which is composed of strands, numbering from four to six, which when untwisted make a very serviceable and cheap wire for straining on wooden posts. Not being galvanized they are liable to corrode, and should, for preservation, have a coating of paint or gas tar—or, what I have found quite as cheap and more convenient than either, a composition, by Hill and Smith, of Brierly Hill—annually, for two or three seasons after erection.

In erecting a wire fence permanency is the primary object to be aimed at, and, as the hand of time generally tells with decay on the posts first, it requires considerable care that they are made of the proper description of wood, and also that that wood is well impregnated with some preservative material. Oak is the best sort of wood, if full-grown, and should, if possible, be used for posts; or, at all events, for the straining or main posts. But, from the general scarcity of oak and its high money value for other purposes, we very rarely find a fence made wholly, or even in part, with it. Luckily, however, we have a very worthy substitute in the larch, which, when of full age, ripe, and full of resinous sap, will last for a great number of years as a post. To increase the durability of the posts, they should be immersed in, or impregnated with, one of the many preservative fluids now in use. Recent experiments point to tar creosote as the best and most ready of applications of any of the known preservative liquids. It should be applied in the manner known as "Champy's process," by which the creosote is heated in a large oblong iron vessel to a temperature above the boiling-point of water: the humid wood is then plunged in, and during immersion the water it contains in its pores is formed into vapour and expelled; the liquid now being allowed to cool, the pressure of the atmosphere forces it into the vacuum thus formed by the expulsion of the water, and thus forming the soluble matter into insoluble compounds greatly increasing the durability of the timber. As before stated, wire fences are made of various heights, to suit the circumstances; but we purpose to give a short detail as to the mode of erecting one four feet in height with six wires, such as is generally erected to fence sheep, cattle, and horses. We may here state that the tools necessary in making wire fences consist of a "wire strainer," to stretch the wire, knotting-tools to joint it, "straightener" to take the bends and coils out of it, and "collar vice," for taking a temporary hold until a knot is made, or an increase of tension by two applications of the strainer. A most efficient set (as above) is supplied by Kennan and Son, Dublin.

The line of fence being agreed on, have the first straining post made 7 ft. long, and to square 5 inches, and made of the best oak or full-grown larch wood. As the fence is to be 4 ft. high, or, rather, 3 ft. 9 in. to the topmost wire, the straining post must stand 4 ft. out of the ground, as three inches is allowed from the wire to the top of the post: so that it will be 3 feet in ground, and, in dressing it, the whole bulk of the tree should be left intact for that part below ground. Have another piece of larch prepared, about 6 ft. long, and 8 inches by 6 inches, to act as a sole to the post. A piece must be notched or grooved out about 6 inches from one end, about 3 inches deep, and wide enough to allow the bottom of the post to be fitted in, and which must then be secured by four nails passing angularly through the post and into the sole. Another piece must be grooved out, about the same distance from the other end, for the reception of another piece of wood, about 5 inches by 3 inches, which is placed obliquely to meet the post—and into which it is slightly grooved—and act as a stay against the strain of the wire. But before the sole is fitted to the post, have the latter bored with half-inch holes at proper distances, through which to pass the wire, commencing with a 5 inch width, and increasing to 10 inches for the topmost wire.

Having the post, sole, and stay fitted together, as described, next dig a pit, very exactly in the line of fence to receive it. This pit must be about 3 ft. 4 in. deep, and as near as possible the length of the sole; and, after being properly levelled at the bottom, place the sole and post carefully put in, the long end of the former being placed with the run of the fence, to assist the strain when the wire is tightened up. The post must be set truly perpendicular, and, to assist the eye to accomplish this, a cord with any small weight attached to its end may be used as a plummet, which, being held between the post and the eye, and at some little distance from it, will show to a nicety any variation they may have from the vertical. When got in a perfect upright position, have two pieces of wood pointed at the ends, and about two feet long, driven, one into the ground at each end of the sole, and which are for the purpose of firmly securing it in its proper position, and for this end they should be well driven home.

The soil may now be returned to the pit, taking care not to return more than 2 inches at one time, and also that it is filled and beat down in a regular and level manner. The beating is best performed with the common rammer, such as country carpenters use for solidifying the soil around a gate post; but its efficiency may be much improved by having an iron sole of some weight fitted on the broad end. W J. MOSCROP,

Forest Farm, Great Ribston, Wetherby.

TOP-DRESSINGS FOR PASTURES.

4.—LIME.

The very extreme solubility of lime in water renders the pulverized condition of the substance to be unfit as a manure in the top-dressing mode of application, though in some cases of particular situations very considerable benefits have been derived from the use of lime spread over the surface of pasture land. But it is preferred to place the incinerated lime in a large heap, and to turn it over two or three times in order to effect the complete pulverization of the cinders, and to convert the condition into a mild state of earthy-coolness. More than a year will be required to produce this condition, which may be judged when the heap is turned over. The lime is then spread over pasture lands as a top-dressing at the rate of forty single cart-loads on an acre, in the season of late autumn or early spring, bush-harrowed and rolled by the time of the grass rising in the spring. Lime has the certain effect of bringing into existence an herbage of finer grasses, and of banishing the old pasturage, and the use is very beneficial on the surface of moor lands that are to be brought into cultivation. On thin coarse pastures the advantages of lime are considerable, but such grounds are generally placed in upland situations and under wet climates, and as the extreme solubility of lime in water still attaches to the substance, the preference is established to use the lime in an earthy compost, of which the terrene portion imbibes and retains the caloric of the lime, and forms a warm bed for the roots of the grass plants. The compost is also cheaper than the lime, and is not so soon carried away by water. For these reasons, earthy composts have superseded the use of lime as a manure for top-dressing pastures.

5.—GYPSUM.

Sulphate of lime, or the earthy base, is the combination with sulphuric acid, in nearly equal thirds, of lime, acid, and water. It is found in various forms and conditions, as an accompanying bed of the new red sandstone formation, which covers the coal measures, and also in the tertiary formation which lies above the chalk. The water, not the acid, is expelled by the strongest heat of the furnace, and raw gypsum is pounded and reduced into a coarse meal. The calcined condition speedily absorbs water, and forms a paste, and hence the great use in forming busts and statues. In no condition has gypsum yet been found of much use as a manure: the water and the acid are held in a way that prohibits any useful application of the substance. The only benefits, and these very small, have been derived from dressing young clovers with powdered gypsum; beyond this very moderate advantage, no recommendation has appeared.

6.—SOOT.

Condensed or embodied smoke is a clammy, earthy, volatile matter arising with the smoke by the action of fire or combustible bodies, and condensed on the sides of the chimneys. Though once volatile, it cannot be again resolved into vapour. It has escaped perfect combustion from insufficient contact with vital air, and may be burned again; and the black and brownish colour arises from an oil that is burnt and half reduced to a state of coal. The different qualities and appearances arise from the nature of the inflammable substances, and the manner in which they are burnt. The great basis of its composition is charcoal in a state capable of being rendered soluble by the action of oxygen and water. A slight portion of fibrous matter is volatilized by the fire, and again occurs in the soot. Carbonated ammonia occurs with a black carbonaceous matter, giving a strong pungent smell, with the touch of quicklime. It affords a brown extractive matter, of a bitter taste, and some ammoniacal salts, and also an empyreumatic oil. The soot produced by the combustion of coals is usually reckoned better in quality than from wood or peat; and soot from kitchen chimneys, which is impregnated with the effluvia of cooked victuals, is better than from other chimneys. But experience does not sanction any difference in that way.

Soot is a very powerful manure, and surpasses all other substances in giving a healthy hue to young plants of grain, clovers, grasses, and legumes.

The chief application is on young grains, in the spring, which it never fails to invigorate most amazingly. On clovers the effect is very surprising, and the writer of this article succeeded in fully doubling the crop of winter tares by the use of 40 bushels of soot on an acre, which costs about £1. On pastures the effects of soot are great, and may be sown by hand over the surface in the autumn or spring in the number of 40 bushs. to an acre. The quantity of herbage is much increased, and the quality of the grass invites the grazing animals beyond any other beverage that can be offered. Soot can only be got in the vicinity of large towns, and the effects last only for one year. The volatile properties soon vanish, and the earthy base is very easily soluble.

7.—COAL ASHES

Contain lime and magnesia, the chief ingredients being silicious and aluminous earths, which vary much in the nature and proportions; also some iron, much carbonic acid gas, and carbon and hydrogen. The ashes require to be bruised into powder by mallets, and spread on grass lands, as top-dressing, in March and April, at the average rate of 60 bushels an acre in moist weather, where the effects are very great, and generally certain. The calcareous matters contained in the ashes impart the warming and sweetening quality that is attached to all residual substances from combustion, and accordingly the use of coal ashes and of all alkaline matters is always recommended on sour pasture that produces sorrels, rushes, and mosses, in order to banish these plants by depriving the land of the peculiar properties necessary for their production. The value of coal ashes is very considerable, but can only be obtained in the neighbourhood of large manufactories.

8.—MUD

Is the sediment, slime, or uliginous matter found in the bottom of ponds and of all stagnant waters, and is mostly composed of the earthy particles collected by the waters from the neighbouring grounds, and deposited in the hollow places where the waters congregate, and lose the power of further progress. Leaves of trees and various collections of animal and vegetable matters will be added in many situations, and the composition of mud will in every case be regulated by the nature of the substances which come within the reach of the waters that flow into the pond. In the vicinity of woods much vegetable matter will be found in mud; while in open situations, earths and sands will be the principal materials, washed down and carried along by the rains and currents. Ponds are most conveniently emptied in summer, when the mud may be laid in a heap, in a convenient place, and be frequently turned over, in order to bring into life and destroy the seeds of vegetables that may have been deposited by the water, and which will lie many years in a dormant state, and again vegetate on being exposed to air and light. When this purpose has been effected, a mixture of slaked or mild lime may be added; and after being again turned over and mixed, the heap will be ready for being applied as a top-dressing, and may be used at the rate of 20 to 30 cart-loads to an acre of grass land, and must be bush-harrowed and rolled during the first dry weather in the spring after application. The materials being finely pulverized, spreading from the carts is the best method, without laying heaps on the ground, which are not easily spread out in the bottoms, and raise a tuft of herbage. Mud without any mixture, and in a fresh state, is very beneficially applied in top-dressing grass lands, though the moist condition is inconvenient, in forming lumps and in adhering less or more to other substances. It is better to allow a time to dry, to turn the mass repeatedly in order to be well mixed, and to add a quantity of mild lime to produce a variety of composition. The earths in mud are in a reduced condition, and do not require the caustic solvent of hot lime, as it would corrode and dissipate the vegetable matter. Mud is a weak body, as the cohesion has been wholly destroyed by the suspension in water; the lime combines the action, and produces the results.

UTILITY OF THE NETTLE TRIBE.

In those good old times, which every one regrets in sentiment, and rejoices to have escaped in heart, nettletops did duty for our modern asparagus, and nettle-tea was drunk while Chinese bohea was unknown; and both were pronounced good by the benighted old *gourmets* who found a full savour of rich meaning for their loving cups in the blue flowers of the borage, and made spinach of Good-king-Henry, and a most detestable sauce of Jack-by-the-Hedge. Who, then, would have thought that not only would that "wicked weed," the hop, so cursed by Harry VI., be one day ranked as of the nettle tribe, but that hemp and figs, fustic-wood and mulberries, the bread-fruit of the South Sea Islands, and the jack-fruit, the upas of Java, the banyan of India, the hya-hya, palo di vaca, or cow-tree of Demerara (though some do say that this be a dog's-tooth, and no nettle after all), and the caoutchouc trees of America, should be introduced into these dominions, and classed as kinsmen with the rough-leaved herb, then principally regarded as a sovereign remedy against scurvy, gout, jaundice, and hæmorrhage! If our forefathers had heard of nettle-trees which gave bread, and milk, and paper, which last should be also a capital substitute for cotton cloth; if they could have known that the luscious purple figs, which only thrones and principalities might taste and enjoy, and the black ripe mulberries which lost their purity if touched, though ever so lightly, were to be classed as of the same family with the roadside nettle, they would assuredly have cropped the ears of the propounder of these two mysteries—one ear for lies, and the other for slander. Sir Walter Raleigh and Bruce were both called liars for less wonderful tales than these.

The nettle tribe is very valuable, and the common-nettle itself has many more available uses than one would imagine. Its seeds are good for the *goitre*; its stings are good for paralysis. In Scotland nettle-cloth is by no means uncommon, and is exceedingly durable and beautiful; while Germany calls her muslin still "Nesseltuch" (nettle-cloth), thus betraying its origin; and France makes very passable nettle paper. Greece stains her Easter eggs green with nettle dye—for nettle leaves dye green—and nettle roots treated with alum give a very fair yellow; and both are still used for the woollen cloths of Wales. Nettle juice makes a good rennet; and dried nettles are great promoters of cow's milk. In many places in England, indeed, a pint of milk is paid as an equivalent for a day's feed of nettles in April or May; and Russia, Sweden, and Holland cultivate them solely for dairy purposes.

In the north of England young nettle leaves are given to pigs; and, chopped up fine, they are mixed with the food of all the barn-door poultry, but especially with that of young turkeys, who die if they have no nettles to eat, and die all the same if they wander into a bed of them and are stung. Nettles help to make good hotbeds; and on every thriving strawberry bank there will they also be, helping to make good land, and of signal service to the fruit. The nettle has another claim to our gratitude, for it nourishes about thirty species of insects; the caterpillars of the peacock butterfly, the red admiral, the tortoise-shell, and that briliant-winged fluttering jewel, the *Nymphalis gemmatus*, being among them. These are some of the good qualities and gracious offices of our common nettle of the lanes and fields; but the foreign species are even of higher uses.

In Kamtschatka they make fishing-lines of nettles; and the Hindoo grass cloth, called "chu ma," is from a nettle, as is also the Chinese grass cloth; this last from the snowy nettle *(Bœhmeria nidei)*. The bread fruit tree (*Artocarpus incisifolia*) not only yields a most delicious food, but also gives a beautiful kind of cloth for the South Sea islanders; but the best cloth made from this genus is got from the *Broussonetia papyrifera*, from which the Chinese and Japanese get also an excellent quality of paper. This paper is taken from the outer bark, and in Japan serves for all sorts of common uses. Curtains, umbrellas, clothes, pocket-handkerchiefs, hats and other like articles, are made of it, as also a juice used as a glue in the gilding of paper and leather. The nettle of Timor is not quite so beneficent to man; called *daoun setan*, or the devil's leaf. Its sting produces effects which sometimes last for a whole year, and sometimes result in death; and there is no antidote like our dock to our nettle—' nettle in, dock out"—which can be used to allay the smart or draw out the poison. The daoun setan, would be no trifle in among our strawberry beds, or bordering the hedge rows, where the wild flowers are waiting to be plucked.

Think of our beer without one of the nettle tribe! What should we do now without hops? Yet hops are nettles—"wicked weeds," in truth, but pleasant wickedness. Ale was originally barley brewed with certain herbs, such as sweet-gale, bog myrtle, alehoof, or broom twigs; beer, barley brewed with hops. The novelty raised a storm—all novelties do. "Hops and heresy came together," says Dr. King; and the weed that was named after a wolf could not, by any possibility, be good for man. *Humulus lupulus* is the botanical name of the hop; the first from the rich soil in which alone it thrives; the second from some fancied connection with those uncomfortable gentlemen, the wolves; rendered a little more intelligible by the Welsh name of "wolf's spoon." Ale, that is, malt without hops, but with wormwood instead, is still brewed at All Souls, Oxford, where the College's silver ale-cups are called "ox eyes," or "ox eyes of wormwood;" and the Isle of Skye people brew ale of one part malt and two of heather tops. The Egyptians flavoured their zythus, or barley-wine, with lupin, skirret, and a certain Assyrian plant, which, perhaps, came to much the same thing as our malt and hops.—Chambers' Journal.

HORSE LABOUR.—OXFORD FARMERS' CLUB.

The monthly meeting of the Oxford Farmers' Club was held on Wednesday, February 8, when there was a large attendance of members.

Mr. G. F. Coggins, of Coombe Farm, read the following paper on "The most economical application of Horse Labour." He said :—"The subject I have proposed to introduce for your discussion to-day is the most economical application of horse power. I am well aware that this subject may be looked upon by many (having been so ably and recently touched upon by Mr. Morton in his paper on the forces, &c., read before the Society of Arts) as not to cause any general interest for discussion, still, as I had given notice of this subject some months previously, I am sure you will acquit me of anything like presumption in following so able an authority as Mr. Morton. Of the importance of this subject to the agriculturist generally there can be no doubt when we consider the place the cost of horse labour takes in the farmer's balance sheet. I shall now, gentlemen, take a cursory glance at the theoretical opinion of a horse's power. Most gentlemen here present are aware that the celebrated Watt, the father of the steam engine, estimated the power of the horse to be equal to that which will raise 33,000lbs. 1 foot per minute, or 3,300 lbs. 10 feet high per minute, and so on in like proportion. Now there is no doubt whatever that Watt estimated the actual force of a horse fully one-third more than it really is, and subsequent experimenters have given 22,000lbs. raised 1 foot high per minute as nearer the actual work performed. It is possible that a good horse could do the work equivalent to raising 33,000lbs. 1 foot high per minute, yet only for a short duration of time; but the question is, how long can he maintain this amount of work. These deductions of a horse's power, ascertained by men eminent as engineers, are not without their value to the practical farmer, and, in fact, without making ourselves somewhat acquainted with these established formulæ, the dynamometer tests, so accurately applied at the trials of the Royal Agricultural Society's meetings, seem to us of small value. It is one of the established and first principles of the mechanics that as "speed is gained, force or power is lost," *i.e.* the force an animal exerts to propel a load or machine decreases with the increase of speed. Mr. Tredgold an eminent engineer and a very high authority on these matters, has given the following table showing the relation of speed and traction of a horse, calculated upon the assumption that six hours be a day's work. At 2 miles per hour, 166lbs. of force are given out;

3 miles per hour	.. ..	force	125 lbs.
3½ „ „	.. ..	„	104 lbs.
4 „ „	.. ..	„	83 lbs.
4½ „ „	.. ..	„	62½ lbs.
5 „ „	.. ..	„	41⅔ lbs.

From this table it appears that a horse performs the greatest amount of actual work when travelling at the rate of three miles per hour, and six hours per day at the time of working. I believe that it is almost as universally a law, as any of nature's fixed or known laws, "that the best article is the cheapest;" and I do not think this applies more forcibly in any instance, than that of purchasing the noble machine—the horse. The force of a horse does not lie in itself, but is contained in the food which is daily required to maintain that power; and as we cannot keep up the power in steam engines without the fuel in which the power lies, neither can we obtain the effective power of a horse, unless he be well fed. To buy an old horse, or animal, with an organic disease, or a want of good formation, is like buying an engine with a worn piston and leaky tubes; and when the necessarily expensive food the horse requires is taken into consideration, the first cost is certainly not an object. Another point, and of very material importance, is the size of a horse. We often hear it said with a nice, neat, clean-legged horse before us (more fit for a light van horse, than anything else) —"What a good gee horse that would make!" But as far as I have seen, I believe that the greater part of farm horses are below in stature what is required for the economical assimilation of their costly food. The power of a draught horse very materially depends upon his weight; and although we do sometimes see a smaller horse with what we call a good pluck (which generally denotes a strong constitution), capable of performing an amount of work which certainly an ill-formed horse, with but little animal spirit, though of larger size, is not capable of doing, the most economical horse, I believe, to be purchased is from 15½ hands to 16½ hands high, with a carcase in proportion to his height. In viewing an animal as the most perfectly constructed of all machines, wonderfully adapting itself to the varied circumstances in which it may be placed, it still has a limited period for its duration of labour, and this is a point that very materially affects the subject under discussion. It has already been shown from Tredgold's tables to depend in a great measure upon the quantity of force extorted, and that a horse working six hours per day can perform the greatest amount of work. But of the manifold operations of farming, some do not require an amount of force that should complete a day's work in six hours for a well-fed horse, and from various circumstances it is necessary, as a whole, that the hours of work shall be prolonged, and the amount of force reduced. Among agriculturists generally we find a great diversity of opinion upon this point, and a day's work consequently varies from 7 to 10 hours. I have no doubt but that peculiarity of circumstances, which almost every farm possesses, in a great measure accounts for this. But still, I think, that prejudice, which affects more or less each of us, gives rise to this wide difference of time which practical men advocate as a fair day's work for a horse. If we feed a horse upon rational principles, and look to natural laws, we shall find that the stomach of the horse is comparatively small, and is adapted to consume a moderate quantity of food, and often. The day should, therefore, be divided into two portions, with as long an enterval between as can be possibly obtained consistently with a fair day's work; and I believe that, by adopting this system, horses will work ten hours per day with as good condition from the same value of food, as those working but eight hours per day with only one yoking. When we consider that in a full week's work of 10 hours per day, 12 hours extra labour, or 1½ day's work per team are gained, it is a matter worth thinking of. The next point that will suggest itself, will be the amount of traction required to be used so that in a day of 10 hours our horses shall not be distressed or over-worked. As an example, I will take the work of ploughing. Supposing the draught of a plough in a certain soil, with a furrow slice 6ft. 9in., to be 200lbs. and two horses used, we then require each horse to give off an amount of force equal to 100lbs. Now, to plough an acre per day in an average-sized field, say 15 chains long and this width of furrow, there would be 58½ furrows 330 yards long, and calculating turnings at one-fifth of the whole, will give 11½ miles nearly as the distance to be travelled, which, divided into nine hours' actual work (this is allowing one hour to be spent in travelling to and fro, yoking, and unyoking), is but a speed of 1⅓ miles nearly, and which is certainly much below what a horse is capable of performing, according to the foregoing tables. I might take other examples on this point, but I do not think the subject before us would be much benefited by such a course. I shall now proceed to show the source from which the power of a horse is obtained, and which I have said before lies in the food consumed. There are two modes of endeavouring to effect an economy in this respect—one, the lessening the quantity of food per horse, and keeping a larger number of horses; the other of retaining the amount of food per horse, but lessening the number of horses. I do not think I shall be far wrong in stating that two horses well fed will do the duty of three badly kept, and at the same time I would urge the necessity of getting good men to attend to and work them. I need not remind you that good grooming is an essential to good condition. During the winter months horses are better to be kept in a comfortable well-ventilated stable than allowed to roam in the yard at will. It is a well ascertained fact that warmth is an equivalent for food. During the summer months, while at green food, I should prefer them in comfortable yards. The quantity of food necessary to maintain the full working condition of a horse must very much depend upon the class of soil, whether heavy or light, whether level or with steep inclines, and various other physical conditions too numerous to mention. I have generally found (and my own occupation consists of land neither very heavy nor very light) that about 70lbs. of corn per week are necessary. The use of hay I have almost discarded in my stable; and I find that by substituting roots in its stead, a practice largely adopted in the eastern counties, a very beneficial and economical application of them is the result. At the present time I allow each horse about 40lbs. of grated mangolds, with chopped straw, per day. The total weekly cost of food will stand thus :—

	s.	d.
1 bushel of oats, at 24s. per quarter	3	0
Half bushel beans, at 48s. ditto	3	0
280lbs. mangold, say 2½ cwt., at 10s. per ton	1	3
Straw *ad libitum* at a consuming price, say	1	0
Making a total per week of ..	8	3

This, you will perceive, is for the winter season. In the summer season, one bushel of oats is well added to the various alternating green food which generally forms the bulk of the food of the farmer's horse. The summer food will stand then as follows :—

	s.	d.
Oats	3	0
Lucerne, trifolium, vetches, clover, &c.	5	0
Making a total per week of	8	0

And 8s. 1½d. will be the average of the whole year of the actual cost of food; this will incur an annual cost of £22 2s. 6d. The wear and tear of horse-flesh will very materially depend upon the manner of feeding; for, if a horse be badly fed, and overworked, old age will appear to come on him prematurely, and it is a shock the system never entirely recovers. I do not think I shall understate the wear and tear if I put it at 10 per cent. per annum on the prime cost of each horse, and this will be allowing each horse to have an average life of 10 years' work. If the cost of each horse be £40, then we have to add £4 to the cost of food, making a sum of £26 2s. 6d. as the annual expense of a horse's power. To illustrate practically the power we have at command, I propose to put before you this proposition :—What number of horses are required per 100 acres to cultivate an arable farm of a given quality? I will take as an example a farm of 400 acres of good stock and corn land, of the general character of soil of this county, and cultivated in a husbandlike manner. We will crop the lands so as to have ¼ under roots and green crops, ½ under cereals, ⅛ under legumes, and ⅛ seeds, commencing at Michaelmas. We shall require, therefore, 100 acres ploughing for wheat, from the middle of August till the middle of October, with a pair of horses, 20 acres of the root quarter for rye, vetches, &c., with a pair, making 120 acres to be ploughed; four ploughs 30 days, at an average of one acre per day, which is easily accomplished with the light furrows required for wheat. The drilling of the same will occupy 10 days for four horses, while the harrowing before the drill and the seed time will occupy four horses the same length of time; eight horses for 10 days, or a total of 40 days' work during the wheat and winter vetch season. The wheat will be all planted by the end of October; we have, therefore, 40 days' work on this ¼ of the farm, from the middle of August till the end of October, comprising 66 working days; if we allow one day per week hindrance, which is far more than an average at this season of the year, we have fifteen days left for

which the work of eight horses may be made available for autumn cultivation, cartage, &c. During the month of November the ploughing for the pulse crop, which will be 50 acres, will be accomplished. ⅞ of an acre will then form a good day's work. It will require four ploughs with two horses nearly fifteen days to accomplish this. The 80 acres of land for roots not under green crop will now require a deep furrow, and three horses must be used to each plough. ⅞ of an acre will still be a day's work, for, although the days are shorter, and eight hours' work are barely obtained, still the deeper stirring requires a broader furrow, and less bouts have to be made. Three ploughs will accomplish this in about 31 days, making a total of 46 days' ploughing during the months of November, December, and January, by which time the winter ploughings ought to be accomplished. We have, therefore, 92 days, 26 Sundays, and wet or frosty days, which gives us the work of nine horses for twenty days for purposes of cartage and ploughing up land after the mangolds and turnip sheep. During February the pulse will be drilled, which will occupy 5½ days for eight horses. The land prepared for barley, which, if much mangold be grown, a considerable portion may be sown during this month, say 59 acres, will employ eight horses five days in drilling, so that we have but 19 days' work on the land besides ploughing. After the turnip sheep, which will not amount to more than ten acres, or 2½ days' work, making 12½ days' work during the 28 days, allowing eight ditto for Sunday and wet weather, we have the work of eight horses for 7½ days for other purposes. During the month of March and the early part of April the fallows (if necessary to be ploughed) will again require stirring, if the weather be suitable, and the rate of work here will be not less than 1¼ per day, and when the breadth of furrow-slice is taken into consideration, the distance travelled will not be greater than to plough an acre of clover ley for wheat. We have then during this period 16 days' ploughing for eight horses upon the fallows, five days' ploughing after turnip sheep, and 3½ days' drilling barley, or a total of 24½ days' work upon the land, 46, or deducting Sundays and wet days, 13, which have left during this time the work of eight horses for 11½ days for other purposes. If the season be favourable mangold planting will now commence, and, perhaps, at no season of the year does this system of long hours and well-fed horses show itself to more advantage than now. It has often occurred to me, when noticing the almost universally successful growth of roots by our north country friends, that much of their success depends upon the management of their horses. I am presuming that the whole of this 80 acres of fallow will be ridged, and considering how comparatively few days in the year we find the land in a good state for ridging; and ridging, unless it be done well, had better be left undone, for it generally ends in half a crop, no matter how well dressed for. I say now is the season that horses up to their work are valuable. Two pairs of good horses will, if well driven, open and shut six acres of ridging per day; but, except in urgent cases, this is too hard a day's work. Four and a half acres per pair per day is, I think, a fair day's work, and the mangold and swede planting will occupy, at this rate, 18 days for nine horses ridging and drawing manure. The turnip land will require three days' ploughing, and one and a half days' drilling for eight horses, so that we have, during the latter part of April and the whole of May, 22½ days' work for eight horses. This, allowing for Sundays and wet days, gives us 34 working days, but as only 22½ days are occupied in the principal operations of the farm, allows 11½ days with eight horses for pressing and horse-hoeing the wheat, barley, extra cultivation in the preparation of late barley, and other miscellaneous operations. Passing on to June, the green crops are folded off, and the land ready to be prepared for turnips, rape, &c. Then with five days' work ploughing the land, and with average weather three days' work for eight horses in preparing the seed bed for drilling, on with the flat artificial manure. We have thus eight days' work in preparing the land, and, allowing for Sundays and wet days, we have 14 days remaining for horse-hoeing root crops, and the cartage of hay, which will be required during this month. In July the work will be light and confined to the cartage of peas, broadsharing the pea stubble, and preparing the land for succeeding green crops. There will be sufficient leisure this month to get the horses into condition for the use of the reaping machine, which is, certainly, at present, rather severe labour. You will perceive, gentlemen, from this statement, that I have been endeavouring to prove that a pair of well-fed horses, per 100 acres of the average soil of this county, are sufficent, with an odd horse to render assistance at certain seasons of the year, and to do the general work of the home-stall. I have not intentionally exaggerated any statement, and I may say, the quantities of work, as given here, are usually performed on my own occupation. You will perceive that I have allowed 52 days in the year as entirely useless, besides Sunday, which is certainly above an average, and the intervals of time in each season, beyond what is actually required for the cultivation of the soil, are more than required for the miscellaneous operations of the farm. I have supposed that one-horse carts are to be used for the cartage of the farm as economising horse labour, that each horse be yoked properly to his work, and trace-harness, where possible, dispensed with, and that the fields are of large size. I do not say that land presenting physical difficulties, such as want of drainage, steep inclines, &c., are to be managed with this power. I do believe this, that much of the land in this country requires no more than is stated here. No doubt but a system of breeding colts and working them young, and selling them off, may be made to pay well, in certain situations; but there are exceptions, and cannot be brought into an argument where general principles are sought as a basis. This is a wide subject, gentlemen, and I know it has been loosely treated, but still I hope it will elucidate some light, and that we shall have a good discussion to follow."

Mr Williams, of Northcourt, having been called on by the President to speak on the subject, said that they were much indebted to Mr. Coggins for the very able paper which he had read, and whether they agreed with it or not was not the question, as the object was to elicit information upon that in which they were all deeply interested. The economy of horse labour was a matter which seriously affected them, inasmuch as it formed a large item of the expenditure on every farm. Whether it was possible to economise or not in that department he was not prepared to say, but, at all events, it was a question deserving of all the attention and consideration which they could give to it. Mr. Coggins had introduced into his paper a great number of statistics, and, although he did not mean to undervalue them, yet he could not refrain from saying that statistical documents were easily raised and were not always to be relied on. In proof of this he would mention that, a short time ago a friend, who was about to take a farm, asked him what it would take to stock it. His (Mr. Williams's) reply was £10 per acre, but his friend said he had put down everything, and could not make it come to anything like that, but he (Mr. Williams) assured him that, in spite of all his theories and statistics, he would find in the end that it would exceed £10, for so many things arose which it was impossible to foresee to calculate for. In his paper Mr. Coggins had not looked into the details of various items on a farm beyond ploughing, and some few other operations which he had given them, but they all knew from experience that there were many others to be looked to; that they often wanted at one time of the year a larger number of horses than at another time; and that one day's ploughing done at the right time was of more value than three times the amount of labour at another, and therefore they were obliged to keep surplus horses, to enable them to do the work at the fitting moment, for to keep only a certain number of horses to do particular work at stated times would not answer. Farming differed very much, and although every farm was a manufactory, yet one man employed a certain amount of machinery, manual, and horse labour, while another on a farm of the same extent doubled it in every department. The more he increased his live stock the greater was his profit; but if he increased his live stock it was necessary to increase his horse labour, for there were mangolds to be brought home, to be cut up and carted to the sheds, all requiring the employment of more horse labour. It might be possible, as Mr. Coggins had stated, to do with only two horses for every 100 acres, but he (Mr. Williams) was satisfied that it could not be done profitably. Mr. Coggins might have done it, and there was no doubt that he did it in the best way. The more a man studied the more he found he had to learn, and the province of Farmers' Clubs was to raise discussions, with a view of eliciting information and truth, so that they might be able to learn something from the results of each man's experience. This was a great practical question, and their balance sheet was every year affected by it; there were, however, many points which had a great deal to do with it, such for instance as the nature of the soil, for on light land two horses would do the work of four employed on heavy land, which required double the number of horses. He (Mr. Williams) had some land where two horses would plough an acre a day, and other land where four horses could not do the same amount of work. He differed from Mr. Coggins, who, he thought, had put the standard too low, for he thought that, instead of two horses to every 100 acres, three at least ought to be kept, and that four could be profitably employed, and he should move an amendment to that effect.

Mr. WATSON, of Medley, being called on, said he had had some experience, for he once occupied 400 acres of land, with a quantity of grass land. At that time he adopted the principle of having horses in pairs to plough, and from his experience at that time he believed that eight horses on that farm would perform a certain amount of work, but were not able to do all that was required of them, because there were so many other things to be performed besides the cultivating the soil and carting corn. On 400 acres two extra horses were required in the improved state of husbandry, and as people improved their farms they must increase the amount of labour, and if they produced double the quantity of produce and kept an increased number of sheep, additional labour was required for cutting mangolds, swedes, and chaff, which during the winter season alone could employ two horses. They must also provide for cases when their horses were not fit to go to work, and have some in reserve, and therefore he concurred with Mr. Williams that three horses were necessary to every 100 acres. He did not mean to say that it was impossible to do with less, for on light farms it might be done, whereas on heavy land it would require double the number of horses, but, taking the average, they required at least three. As to the keep of horses, which Mr. Coggins had put down at 8s. 1½d. per head per week, he (Mr. Watson) had had no experience of feeding them on mangolds and swedes, for he did not approve of it. He also thought that if Mr. Coggins had dispensed with the mangolds, and given his horses instead a truss of hay each per week, he would have found that the horses were better able to do their work. A great deal, however, depended on having good carters, for some men took more out of a horse than others, and injured a horse more with ten miles than others would do in double the distance. In certain seasons of the year farmers did not work their horses so hard as at others, but he thought that they ought to be in such a condition as to be able to do eight days' work in the week if required. At times they might go on the land and yet not have the same effect on the land, but they pulled their horses about, trod the land, and the work was in a great measure thrown away. At other times, when the land was in good condition, and their horses too, they could press them and take advantage of all circumstances, and do double the amount of work. He thought that if it cost 1s. or 1s. 6d. per week more to keep their horses, or kept them on hay at 2s. per week more, it would be an advantage to the farmer, and the horses would be in better condition. He knew that they could keep them in condition with a certain amount of chaff and hay, and fit them to perform the labour required, but he could come to no other conclusion than that three horses to every 100 acres could be more profitably employed than two, and therefore he should second Mr. Williams's proposition.

The President said that, as he was obliged to leave by train, he would simply say that he infinitely preferred driving his work to his work driving him, and would rather have extra horses kicking their heels in the straw-yard than to be at a loss for them when he wanted them, and when it would pay best to have the work done. He was inclined to go even farther than Mr. Williams, and to say that they could not do with less than four horses to every 100 acres.

Mr. T. G. Gibbons, of Whitehill, having been called on, remarked that Mr. Coggins considered that two horses were sufficient for every 100 acres, while Mr. Williams and Mr. Watson thought three were required, and the President advocated four. He (Mr. Gibbons) thought that with twelve horses 400 acres could be cultivated in a husbandlike manner, and he would rather have a extra horse or two in the straw-yard, so as to have them ready for their work, than defer his work for the want of horses. Modern farming required autumn cultivation, and, with a surplus stock of horses, one ploughing in the autumn was oftentimes a greater benefit to the farmer than two or three ploughings later in the season. There were many operations which required to be done, but which they could not do where there were only two horses to 100 acres, and he agreed with Mr. Watson that two horses were required for odd purposes alone on a farm of 400 acres.

Mr. Lane, of Whitehill Farm, was of opinion that they could not do with less than three horses to every 100 acres.

The Vice-President, being called on, said, he thought that the subject was one upon which they must leave an open verdict, as he could not see how they could arrive at any definite conclusion. At the same time, he was more in favour of four horses to every 100 acres than to two, and as to feeding horses on mangolds and swedes, he disapproved of it, and considered that the best food for horses was dry food.

Mr. Williams, of Northcourt, explained that, when he spoke of three horses to every 100 acres, he meant three horses in good condition and kept up to the standard, and unless they were so they would not do the work. They could not drive two horses with reins to advantage, for it was an injury to the land, inasmuch as it destroyed its nice pulverized character, and, therefore, it was essential that they should be driven out of the furrows.

Mr. Coggins replied and said, he expected a better discussion as to the amount of work which could be performed by horse labour in a day. The general work on a farm of 100 acres could be done by two horses, but the first condition was, they must be good horses, not worn-out ones, but capable of working 10 hours a day, as was the case in the north of England. A question had been raised whether on an ordinary stock farm land for sheep they should plough with two horses. Nearly all their ploughing was now done in autumn, but he maintained that it was not wrong in the winter season to plough in the furrows, nor would any harm be done by pair-horse ploughing in early barley land, or on bean land got up early and kept up well with sheep. He had allowed more days for non-employment of horses on account of weather than the meteorological tables would justify, and, therefore, that allowed ample time for carting their corn to the field. He recommended the keeping of an extra horse if it were found necessary, and he believed that the others would be more than sufficient to do the work of the farm, provided the buildings were properly arranged and well situated.

Mr. Williams's proposition was put to the vote and carried, and after a vote of thanks to Mr. Coggins for his paper the Club broke up.

THE STRATHORD PLOUGHING MATCH.

The excitement over the great National Ploughing Matches at Warwick and Edinburgh will not easily die out. The altogether-unexpected triumph of the Hornsbys at the one, and the high favour of the Howards at the other, are events well impressed upon our memories. The wordy warfare that followed, the impracticable combination against the Prize System, the show-up of the Agricultural Engineers' Association, and such like civilities, all tended to keep the thing alive. Strangely enough, however, they did little or nothing to injure the honest repute of the implements themselves. Divested of all collateral compliment or recrimination, the position of Hornsby's ploughs at Warwick was felt to have been fairly gained. Tested on its real merits, never could there have been a greater victory than that of Howard at Edinburgh, in the face of Scotch judges, Scotch ploughs, and Scotch prejudices. There is something, indeed, rather manly and telling in thus riding forth as it were like the knight-errant of old, to do battle in a strange country; and a Champion under such circumstances is sure of our best sympathies. Mr. Howard is everywhere met with congratulations and—orders.

But "the Trade," as it is termed, clearly got a little jealous of all this. They did not profess to understand that they could have gone in for honours at Edinburgh, although they threatened that, at the first opportunity, they most assuredly would. Of course the No-prize confederation at once became the by-word that it was very evident from the first it must. The Howards had already been in competition over the Border, so there was nothing to stop them. Mr. Hornsby had bodily withdrawn from the Combination Society, and had pretty well made up his mind that nothing again should keep him out of the fight. The Ransomes, to be sure, were amongst the oldest opponents of competitive examination, and there was no saying how they might still hold out against the temptations of a honorarium. However, opportunity is seldom long wanting to those who are anxious for it. The Duke of Atholl's two years of office as President of the Highland Society have done wonders, and we really believe by this that he is as fond of farming as he ever was of deer-stalking, or marshalling his clan on high days and holidays. Another ploughing match is announced for the second week in March at Strathord, near the Stanley station on the Scottish North Eastern Railway, under the especial auspices of his Grace. "The match excites great interest, the entries in all being no less than thirty-one." These, of course, included wheel ploughs and swing ploughs, and as certainly the names of Howard and Hornsby. We are a little nervous at first as to the appearance of our other great English plough maker, but it is only for a moment we have to endure any such suspense. "As showing how keenly the competition was gone into, we may mention that Messrs. Ransomes and Sims brought with them from Ipswich a pair of beautiful Suffolk horses." And then one involuntarily pictures the magnificent pairs we saw in the plough field in August, and tries to estimate how even the clean-legged chesnuts might figure amongst them.

There is no unseemly haste in coming to conclusions at Strathord. For two days are the Judges earnestly engaged in investigating the merits of the different ploughs. And these Judges are themselves all men of repute; amongst them Mr. Stephens, the well-known Editor of "The Book of the Farm;" Mr. Hope, of Fenton-barns—perhaps the first farmer of the Lothians; and Mr. M'Lagan, a gentleman known to be admirably qualified for such an office. By the end of the first day they have cut down the thirty to ten, and of those standing in there are Hornsby and Howard from the English, and Andrew Gray of Meigle, Robertson of Guildtown, Findlayson of the Bridge of Allan, and Douglas Allan of Caputh, from among the Scotch makers. On the second they run these ties out, and the Edinburgh edict is at once upset. The Scotch swing plough, made by Gray of Meigle, is placed first; another Scotch-manufactured implement, but a wheel-plough, in the name of Findlayson, is second; and then the Hornsby's come in for third and fourth, and Gray again fifth. The Edinburgh winner now finishes nowhere, and people for a moment confess that they cannot make it out.

The *North British Agriculturist* reports that "the fields were not deemed very suitable for the trials;" and that "this is to be regretted, as it may tend to deter the English implement-makers from coming forward to compete at Scottish ploughing-matches." We should hope not. The further these trials are carried the more interesting will they become. Of course this award leaves the question of swing or wheel plough a more open one than ever—at least so far as Scotland is concerned. It may be difficult as yet to reconcile the unmistakable excellence and superiority of Howard's plough at Edinburgh, and its utter want of distinction a few months afterwards at Strathord. The only ostensible solution is that "it all depends upon the Judges." But we must repeat that these are men of high standing, although it might be interesting to ascertain what experience they have in the use of the wheel-plough, and whether they have ever had it in work on their holdings. Local association and habit may have more influence over us than we may be inclined to admit; and we would suggest that for the future, when the English Houses are expected to enter, that one if not two English Judges, out of so many as a quorum of five, should be appointed. As it is, our friends will, perhaps, come back and say "The ground was bad and the Judges were Scotch." But, then, the Judges were all Scotchmen at Edinburgh, and this makes the result yet more incomprehensible.

We are by no means trying to make excuses for any national discomfiture. As it was, the Hornsbys took very good rank; and, as wheel *versus* swing-plough, we might understand their being worsted. But, then, the second is a wheel-plough; and the Scotch farmers, on such evidence, will go home again strong in the conclusion that not only is the swing-plough still the best in the world, but that even when it comes to making a wheel one, the Scotch is again the best. In fact it is not so clear, after all, but that we get our most valuable hints in the art of plough-making from Scotchmen. The October part of the Highland Society's Journal furnishes a very good report of the Edinburgh Show; and in this we find it declared that, "if there is one feature in the exhibition of implements more worthy of notice than another, it is the greater convexity of the mould-boards which the English manufacturers have attached to their ploughs. And in none is this more observable than in the plough of Hornsby, which was entered not for competition, but for exhibition only. In short, in the principal English ploughs exhibited—namely, Howard's and Hornsby's—there is a nearer approach to the Scotch ploughs in the setting of the irons and the form of the mould-board this year than has ever been observed before. To what are we to attribute this? The Duke of Athole, President of this Society, taking a great interest in the practical details of agriculture, and having purchased some English ploughs, resolved to have the merits of the English and Scotch ploughs compared and tested. He accordingly organized a ploughing-match, open to all makers of ploughs, which was held at Stanley, in Perthshire, last spring. Some of the English makers, or their representatives, attended, who were convinced, by the work executed by the different ploughs, that the form of furrow, and the placing it in the position to form the seed-bed practised in Scotland, were the best for general purposes. The result of this day's work and observation at Stanley was the improved plough of Hornsby." This, it must be understood, was on the occasion of the first match at Strathord, just a year since. And, again, another passage may actually account for the Bedford plough being so superior at Edinburgh, and so inferior at Strathord: "Owing to the drought which prevailed last summer, the soil of the trial-field, naturally friable and gravelly, was very hard, and difficult to turn over, and few of the ploughs went sweetly in it. It was evident that the wheel-ploughs had the advantage of the swing ones in the soil, as the wheels kept them at a uniform depth, and left a more even bottom in the furrow. In summer-ploughing generally wheels will have the advantage. For this reason—and as the objection found to the use of wheels by those who have tried them in Scotland is on account of their being easily clogged when the surface of the land is damp, and who have for this reason discontinued them—would it not be advisable to divide the ploughs into two classes, 'wheel' and 'swing?' Howard's plough was *facile princeps* of those competing; but Hornsby, though not competing, received permission to exhibit the working of his plough, which elicited the admiration of both farmers and implement-makers." And then, naturally, we turn to the heading of this Report, and see it is by a gentleman we have already had occasion to make favourable mention of, in the course of these remarks—Mr. Peter McLagan jun., of Pumpherston. Fortunately, as we take it, Mr. McLagan was not only one of the Judges at Strathord (he was not at Edinburgh), but he it is that has been appointed to draw up the Report of the trials, and the reasons for the award. The paper in the Journal shows how capable he is of doing this, while the Strathord Report itself must be in every way one of the most interesting that has ever been issued. Never, indeed, was one so much required, Let Mr. McLagan go fully into the question of the swing-plough being the better at one period of the year, and the wheel at another; and then let him show us that they have actually a better wheel-plough in Scotland than we have here in England; with ample explanation of other points at present by no means generally understood. The Duke of Atholl has done right good service by insisting on the Report. It is alike a duty to the public, the competitors, and the Judges themselves; and we hope to see it go for a precedent hereafter.

Last year the Duke of Atholl made arrangements for a ploughing match at Stanley, Perthshire, with the view of testing the relative merits of swing and wheel ploughs, which attracted a good deal of attention. This season the match has been renewed, and came off on Wednesday and Thursday at Strathord. Thirty-one ploughs were entered, nearly the whole of which competed. Among the English makers who competed are the names of Messrs. Ransomes and Sims, Hornsby and Son, and J. and F. Howard, Bedford. It will surprise some to learn that Messrs. Howard's ploughs were not placed, while Hornsby and Son's only obtained the third and fourth prizes. Mr. Andrew Gray, plough manufacturer, Meigle, was again this year the most successful competitor. The first prize was awarded to No. 4, which was made by Andrew Gray, Meigle, and the second to James Finlayson, Pendreich, Bridge of Allan. The third and fourth to Messrs. Hornsby and Son, Grantham, Lincolnshire. The fifth to Andrew Gray, Meigle. The ploughs awarded the second, third, and fourth prizes are wheel-ploughs—the first and fifth are swing-ploughs. The conditions of competition were a depth of not less than six inches. The weight of the ploughs, as tested by the dynamometer, formed an element in determining the respective merits of the competing ploughs. As showing how keenly the competition was gone into, we may mention that Messrs. Ransomes and Sims brought a pair of horses from Ipswich for the trial. Some of the other competitors had their ploughmen to guide the implements. The fields were not deemed very suitable for the trials. This is so be regretted, as it may tend to deter in future the English implement makers from coming forward to compete at Scottish ploughing matches. It was stated on the field that the Duke of Atholl insisted that the judges should furnish a formal report, stating the reasons which guided them in their awards. This is a step in advance, and one that we should expect to see advocated by his Grace in the Society of which he is President—the Highland and Agricultural Society of Scotland. We understand that Mr. Peter M'Lagan, jun., of Pumpherston, has since been appointed to draw up the formal report.—North British Agriculturist.

The match was confined to makers of ploughs alone, each maker being allowed to exhibit two ploughs of each class—wheel or swing. The match excited great interest, as it became one of national importance, makers from all parts of the kingdom being there—Ransomes and Sims from Ipswich, who brought with them a pair of beautiful Suffolk horses; Richard Hornsby and Sons, Grantham, Lincolnshire; J. and T. Howard, Bedford; and a number of the Scottish implement makers. The number of entries was no less than 31. The weather was beautiful throughout, and a large number of farmers and others crowded the ground. Her Grace the Duchess of Atholl and Miss M'Gregor were on the field during the first day. The judges, Mr. Henry Stephens (author of the "Book of the Farm"), Mr. George Hope, Fenton-barns, Mr. Peter M'Lagan, Pumpherston, Mr. Thomas Wylie, of Airley Wight, and Mr. Ford, Harden-green, Dalkeith, were on the ground both days during the whole time, the first day being devoted to ploughing half an acre of lea by each plough entered for competition, and the second day to testing the draught, turning over fallow, &c., &c. At a given signal—the firing of a gun—the ploughs started, and it was a beautiful sight, the whole field alive with motion. At the close of the first day's proceedings ten ploughs were selected by the judges to return to the second day's competition, all the others having fallen, the fortunate ten being Richard Hornsby and Sons, Grantham, 3 ploughs; Howard, Bedford, 1; Andrew Gray, Meigle, 2; David Robertson, Guildtown, 1; James Findlayson, Bridge of Allan, 1; Douglas Allan, Caputh, 2. The second day the frost was rather severe, and made the draught much heavier than it would otherwise have been. The judges, after patient investigation, awarded as follows:—1st prize, Andrew Gray, Meigle, swing; 2nd, James Findlayson, Bridge of Allan, wheel; 3rd, Richard Hornsby & Sons, wheel; 4th, Richard Hornsby & Sons, wheel; 5th, Andrew Gray, Meigle, swing. The judges have agreed to write a report, giving their reasons for the decisions they have arrived at. The Duke of Atholl took great interest in the match, attending both days, and presided at a public dinner on the close of the first day's proceedings, when about 100 gentlemen sat down to discuss, not only the excellent dinner which was provided, but many subjects of importance connected with the proceedings of the day.—Galloway Advertiser.

THE HIGHLAND AND YORKSHIRE SOCIETIES' SHOWS.

In November, 1859, Lord Herries, as President of the Yorkshire Agricultural Society, forwarded to the Duke of Athol a resolution from the Council of that body, objecting to the shows of the two societies being held simultaneously, and suggesting that "in future the time of holding the meetings of the Highland Society should be so fixed as to avoid the first week in August." The directors of the latter, though well impressed with the disadvantageous manner in which the two shows interfere with each other, were not prepared to adopt this suggestion, nor to admit the grounds on which it was advanced. This subject was formally brought under the notice of the Yorkshire Society by the Highland Society so far back as 1853, and again in 1856, and certain resolutions passed. The directors of the Highland Society still adhere to the views then expressed, and are of opinion that no change can be made with full advantage to the public, which does not permit exhibitors to take the meetings of the Royal English, the Yorkshire, and the Highland societies in succession, an arrangement easily accomplished, as the interval between the first and last affords ample time for the meeting at York.

The Highland Society has, like the Yorkshire, been in the habit of holding its shows during the first week of August, and it would readily give way, could the difficulty thereby be obviated; but the second week of August cannot be taken, on account of the 12th happening to fall within it—a counter attraction it would be impossible to contend against.

The subjoined is the letter from Mr. Hall Maxwell to Mr. Hannam, Secretary of the Yorkshire Society, dated 4th December, 1856:

"Dear Sir,—I am induced to write to you in the hope that some means may be adopted in order to prevent our respective shows occurring at the same period. I am aware that by the rules of both Societies their meetings should be held in the first week of August, which, I presume, with you as with us, will be that commencing on the 3rd; but I believe that either body can obviate the inconvenience of simultaneous meetings by altering their rule.

"I have no intention of asking the Yorkshire to make such an alteration, on the ground that it should concede to one of the three national societies. I stand entirely on the public convenience. The Royal Agricultural Society of England meets at Salisbury in the week commencing on the 20th July; let the Yorkshire take that beginning on the 27th; the Highland Society the 3rd of August; and let the Irish close the ball. We should thus play into each other's hands, and accommodate exhibitors by enabling those who wish it to take the four shows. "I am, yours faithfully,

"J. HALL MAXWELL."

MARCH MEETINGS.

Town has been very full; but it would not have been safe to trust altogether to appearances for what was going on. There were martial-looking gentlemen hurrying to and fro, yet with the most peaceful and unanimous of intents. From morning till night they were bowing and dining and dancing, and all on the best possible terms with themselves and each other. There was nothing more terrible here than the appalling appearance of some very fancy uniform, or the heavy tramp of a veteran rifleman. The belligerent spirit was far more carefully clothed. It took the garb of peaceful country-gentlemen and well-to-do agriculturists. It turned its back alike on St. James's Palace and St. James's Hall, and, hailing a Hansom, went at once for Hanover-square. The long gun was discarded, the smart sabre thrown aside, and the warrior prepared himself for battle with nothing better than an amendment or a counter proposition. In a word, while her Majesty was receiving her dutiful Volunteers, on the same day, and at just about the same hour, the President of the Royal Agricultural Society was having audience with his not very dutiful counsellors. On the self-same evening when the gallant officers were about to show their gallantry in another way, and were smiling and posturing to their partners in Covent Garden, the respectable Members of the Society of Arts and their friends were all but shaking their fists in each other's faces, and calling one another the most uncomplimentary of names, at a pleasant little Meeting they had convened over the agreeable subject of Town-sewage.

Happily for the Royal Agricultural Society the official proceedings of its Council are this month allowed to tell something of their own story. Nay! more than this, a committee has been appointed to consider "whether any and what changes should be made in the present mode of reporting the business transacted at the Weekly and Monthly Meetings, both for the use of the Society and for communication to the public journals." There is a vast improvement already, as any one will see, who chooses to compare the March report in our columns of this day with that of the preceding month. Not that the present one even tells quite the whole of the story. Of course the great business was the appointment of an editor for the *Journal*, and of course everybody knew Mr. Frere would be recommended. The published proceedings go on to say, "The Committee had no hesitation in recommending Mr. Philip Howard Frere as a gentleman in every respect fitted to perform the duties of editor to the Society. Mr. Frere was therefore duly appointed to the office." This would all seem to read pleasantly enough, but the matter was anything but so summarily disposed of. In the first place the Journal Committee had to explain who Mr. Frere was. The answer is that this gentleman is the Bursar of Downing College, Cambridge; that he has always had a taste for agriculture, and that he unites with this some practical knowledge of its details, as well as, from his position, a certain experience in the management of landed property. The University education and residence were manifestly held to be a stronghold in his favour. The meeting generally, however, was anything but unanimous, and after some warm discussion, Mr. Hudson, of Castle Acre, proposed Mr. J. C. Morton as the most fitting person for their Editor, and Mr. Edward Pope seconded the nomination. But on the President putting the original recommendation, it was declared carried, and, as the report then runs on, "Mr. Frere was therefore duly appointed to the of-office." Then there is another of the few matters in which the general body of Members may be supposed to take some interest—that of the dinner in the Show week. It is well known that the local authorities at Canterbury are very desirous there should be one, and that the more practical members of the Council are also of this way of thinking. A motion was accordingly made on Wednesday to revive the dinner, and the proposal was pushed on to a division when it was lost by one vote. We feel bound to give these further particulars. Surely the world has a right to know that another man was put into nomination against the new Editor, and that a proposal to have a dinner at Canterbury was brought forward? But both these propositions emanated from practical agriculturists. Why, then, the silence with which they are treated?

The great attraction at the Society of Arts was not so much the subject of sewage, as Mr. Mechi's promised explanation of how he clears his six or, as now put, *seven* hundred a year by Tiptree. The world is to unravel this from what he calls "Mr. Alderman Mechi's Agricultural Catechism," and that we give in another place. Curiously enough, he read but little of this at the meeting. We shall not weary our readers with the whole of his paper, or the subsequent discussion, one of the worst conducted we ever witnessed. When Mr. Mechi sat down, a gentleman arose, who, it turned out, was engaged in getting up some Sewage Conveyance Company, and who went on reading "stale and unprofitable" extracts of where sewage had been applied, until his audience fairly lost their patience, and insisted on his refraining. Then Mr. Halkett, much to his surprise, found himself elevated into a co-equal authority with Mr. Lawes, on the strength of a long letter he sent us a month or so since. Mr. Mechi favoured the company with a tolerably good extract from this in his opening address; but to the consternation of everybody Mr. Halkett himself subsequently "took up the wondrous tale," and went on bodily to read his own letter from a printed copy he had in his hand. This had precisely the contrary effect to reading the Riot Act. It did not disperse the people, but it mads them more noisy and angry than ever. The old spirite of Telfer and Kennedy were exhumed again, only to be more utterly demolished; and, although chemists do not seem as yet to have discovered it, there must be surely some very belligerent properties in the composition of town sewage. The meeting got from worse to worse. Contradictions and personalities became more and more direct and offensive; and through all this hubbub and mystification we looked in vain for the solution of that which brought us there —"How Mr. Mechi clears his £700 a-year by Tiptree?" We leave our readers to solve it, if they can, by the Alderman's catechism.

This was the constantly-recurring topic of the week, and there is no disguising the fact that it is everywhere conceived to be a mistake. It is commonly concluded that Mr. Mechi has only deceived himself. At the meeting of the committee of the Farmers' Club, on Monday, a letter was read, suggesting that the committee should "ask Mr. Mechi to give his balance-sheet." And at the Society of Arts Mr.

Sidney added:—"That statement of profits of £700 a year from a 170-acre farm certainly had created a sensation. No doubt Mr. Mechi believed it, but he (Mr. Sidney) felt bound to tell the Society that, at a very numerous meeting of the Central Farmers' Club, on the previous Monday, including the first and most advanced farmers in the kingdom, the statement was received with perfect incredulity; and an offer to investigate the accounts, by three eminent farmers, one being Mr. Little, the land-agent, of Chippenham, had been refused by Mr. Mechi." It could not even be kept out of the Club's monthly discussion on "the Over-preservation of Game;" for in his speech here Mr. Hudson, of Castleacre, said:—"I do not know whether our friend, Alderman Mechi, keeps a large head of game at Tiptree; I know him to be a keen sportsman. At any rate, *his* game has not done much damage to his crop; for it is in print that he has made £600 a year profit as landlord and tenant upon his little farm of 170 acres at Tiptree. Now, gentlemen, I believe you would all be satisfied if you could make 20s. an acre profit these times, with wheat at 42s. a quarter. This would leave above 50s. an acre for Landlord Mechi. Verily, I think Landlord Mechi gets the *lion's share!* I should like to take a leaf out of the worthy alderman's book; for I have a small farm in Norfolk, let to a good tenant at about 30s. an acre, worth 50 per cent. more than Tiptree." The discussion on the Game question must be left to speak for itself.

LONDON, OR CENTRAL FARMERS' CLUB.

OVER-PRESERVATION OF GAME.

The second monthly meeting of the Session took place at the Club House, New Bridge-street, on Monday evening, March 5. Mr. L. A. Coussmaker, of Wentwood, Farnham, presided; and amongst other members present were Mr. Hudson, of Castleacre, Mr. Fisher Hobbs, Mr. Owen Wallis, Sir James Duke, Mr. T. Owen, Mr. B. P. Shearer, Mr. J. J. Mechi, Mr. G. H. Ramsay, Mr. R. Bond, Mr. S. Skelton, Mr. T. Congreve, Mr. J. B. Spearing, Mr. Bullock Webster, Mr. J. Cressingham, Mr. James Thomas, Mr. W. Cheffins, Mr. J. G. King, Mr. E. Purser, Mr. E. Little, Mr. J. A. Williams, Mr. G. Wilsher, Mr. J. Parkinson, Mr. R. Goldhawk, Mr. H. Shotter, Mr. H. Corbet, Mr. T. B. Chapman, Mr. E. B. Waite, Mr. P. F. Pell, Mr. S. Sidney, Mr. G. P. Tuxford, Mr. W. Eve, Mr. J. Dumbrell, Mr. J. A. Nockolds, Mr. J. H. Sawell, Mr. R. W. Keep, Mr. E. B. Acton, Mr. Copeland, Mr. J. Wood (Croydon), Mr. Carr, Mr. Fidler, Mr. Matheson, Mr. Rix, &c., &c.

The subject for discussion, to be introduced by the Secretary of the Club, Mr. H. Corbet, was "The Over-preservation of Game."

The **Chairman**, in opening the proceedings, observed that the subject about to be discussed was a rather delicate one. There were no doubt some gentlemen present who felt very strongly upon it, but who, at the same time, were good sportsmen, and had no objection to see a fair amount of game on their farms. That could not be the case without a certain degree of protection. It was the abuse of game-preserving that was objectionable, and they must always be careful not to argue from the abuse of anything against its use. He was confident, however, that the question would be treated in a proper manner by the gentleman who had undertaken to introduce it.

Mr. **Henry Corbet** then rose and said:—When the Committee placed this subject on their card, I do not imagine that they had any desire to countenance an attack on the national sports of the country. At any rate I have no intention to make one. On the contrary, I believe that any attempt to do away with our rural sports and pastimes would be a grievous error, and that none would oppose such a movement more than the farmers themselves. It is the practice of these pursuits that goes to cement the union between the landlord and his tenant, that teaches the one to regard the other with a feeling something beyond the mere consideration of pounds, shillings, and pence, and that nourishes between them a stronger sympathy, and a healthy tone of good fellowship. You must all have witnessed the welcome with which the master of hounds greets the yeoman as he comes up to the cover side—a recognition that many a much finer gentleman looks in vain for. You well know, too, when the more humble harriers meet in the grass-grounds, what a lunch the missis, of her own doing, is sure to have ready at that happy nick of time, when the squire having killed his first hare, curiously enough begins drawing close round the home buildings for a second. And you can picture faithfully enough how, when the Major and his brother from Cambridge are seen beating the stubbles, the young one rides up on his pony to know whether they will come on to the house, or have it sent out to them? Need I say how much that significant "it" means? What genuine hospitality is involved in "it"? Or, that master Tommy gallops back with a brace of birds slung each side of him, and a leveret in his hand, to tell mamma "they are coming to see her." I should be sorry to record such scenes as these as but the mementoes of a by-gone age. Or, that I had to draw only on my imagination for that we all hope so often still to realize. You will remember, again, one of the yet most popular toasts at your agricultural dinners, how, when you have cheered "the chairman"—and "the society"—and "the county members"—and "the town members"—and "the town council"—and "the dean and the clergy"—and "the railways"—and "the turnpike trusts"—and "the canal companies," and the hundred and one similar ceremonies which seem inseparable from such an occasion, you cheer and re-cheer more than ever for "foxhunting." How the glad tally-hoes and the triumphant who-whoops come from your very hearts; and how when the Master, who has been sitting very quiet so far, gets up and says in a few straightforward sentences "he wishes to show sport, but that he cannot do so without the farmers back him, as they have done, and as he hopes they still"—how here the orator is interrupted with an overflowing simultaneous outburst of applause, that quite spoils the point of his speech, but that, I fancy, satisfies him well enough, nevertheless. A very startling antithesis here presents itself. Suppose that, at some of these gatherings, amongst the toasts bearing upon the pleasures of a country life some one should give "The noble and truly British sport of battue-shooting." How he would dwell on the way in which it brought the English gentleman to the Halls of his Fathers: how it endeared him to his neighbours and his tenantry: and how it caused him to be beloved and respected by all around him. And then, as the noble Marquis, with whose name the toast was associated, rose to respond, with what a roar, too, would he be received! And he would go on, like our other friend the foxhunter, to say that he had always tried to show a good head of game; that, thanks to the farmers who had always kept it for him, he could kill his hundreds on hundreds of hares and pheasants in a day, and that he only hoped they would still continue to keep up—But here, too, would he be met with such a roar as I care not to chronicle. As Sterne says, "the picture we have raised is too painful to pursue." I start, then, with the admission, that farmers as a class are generally partial to field sports. Whether it be riding to hounds, backing their long-tails for the best of the course, or enjoying as much as any one a day's shooting, they like to have their turn occasionally. It would be absurd to attempt to deny this, as useless to endeavour to conceal how really many of them excel in those pastimes I have mentioned. Men with tastes likes these will be the first to make every allowance for their landlords, and I think that if we could poll the country through, we should have an immense majority in favour of that kind of country gentleman who could add "a good sportsman" to his other recommendations as a good landlord and a good man. The very wording, however, of my subject of itself draws a distinction. The point of the case is very similar to that of the great smoking controversy, as so well put in one of Leech's telling caricatures. "I don't care what you say, Frank," complains his sister Clara, "but I shall always think it a nasty, odious, dirty, filthy, disgusting habit." To which Frank more calmly rejoins: "Haw! I am really surprised to hear such a clever girl as you are running down smoking in such strong language; for it's admitted by all sensible people, you know, that it is the *abuse* of tobacco that's wrong." It is precisely so with game and the Game Laws. It is the abuse, and not the use, we complain of. I am not one of those who would argue that the game should belong to anyone who could manage to knock it down—or, in other words, that it should be wholely destroyed and rooted out from amongst us as soon as it be possible to effect such a consummation. But I have to draw the line between what is use and what is abuse—what is fair sport and what is grievous injustice. In the first place let us ascertain the character of the *battue* in the eyes of the great body of Englishmen. What do nine hundred and ninety-nine men out of a thousand think when they read the *Morning Post* paragraph of what the Earl of Wholesale and Retail, and three or four other great Guns, did the day before yesterday at his lordship's magnificent seat, The Slaughter-house—when "in the course of the morning they killed some two hundred head of pheasants, a hundred and fifty hares, three hundred rabbits, two woodcocks and a water-hen, seriously wounded a jack snipe, as well as an under-keeper, and half-ruined a tenant-farmer"? With what kind of feeling is it that we regard such terrible sportsmen who thus blazon forth their wondrous achievements! Is it with respect?—with a certain pride in the prowess and manhood of our English gentlemen?—Or, rather with something like disgust, and an inclination to ridicule the whole proceeding? Have they any of the true attributes of sportsmen—the excitement of finding and following their game—the pleasing recollection of how steadily Dido hunted up to her birds—or how old Brush stood to the winged pheasant in the hedge-row? Is theirs the long bracing beat, the healthful fatigue, and the well-won rest that so gratefully crowns their day's sport? Or, do we picture some half-dozen gentlemen lazily turning out about mid-day, and placed with all due regard to rank and precedent by the head-keeper at certain favoured spots—at the heads of rides, and on to "hot corners"—where they have nothing to do but blaze away as fast as one set of men can load their guns for them, and another gang drive the game up to them. What exercise—what skill—what of the pleasures or the prowess of a sportsman's life is there in this? The lad who gets his three shots a penny at the ring-running hare in our famous home-preserves at Cremorne may be quite as good a marksman; and the worthy citizen who sits in his punt under Marlow Bridge, pulling up gudgeon as fast as the boatman can pull them off again, enjoys a vast deal of the same sort of intense excitement and glowing exertion. But it is a question whether the latter be not the keener hand of the two. He does it merely for the fun of the thing, and nothing more. You do not see him, when he has had enough of it, parading Marlow or Maidenhead with a basket on his head, crying "Fine fresh gudgeon at twopence a dozen!" Or, with more dignity, hastening up to town, and thus addressing his butcher: "Now, Mr. Giblets, as I buy my meat of you, I shall expect you to buy your fish of me. One will go to square the other. Come—I have had a very good hawl to-day—how many score shall I put you down for?" If the Old English gentleman we still sing of and talk about—if he, whose pride it was to keep his mansion at a bountiful rate, and, perhaps, whose chief pleasure was to distribute the game he shot amongst his friends and neighbours—if he, I say, could come again amongst us, and see his son, or his grandson, selling his game as systematically as he breeds it—if he could find a noble duke trying to get rid of the poachers by simply underselling them with the fishmonger of his county town—right heartily would he echo the edict that we are but "a nation of shopkeepers." A country where right honourables and very reverends degrade their favourite amusement to purely a matter of business, and undertake a contract to supply Mr. Fluff, the poulterer, the season through, at birds so much a brace, and hares so much a head. Especially careful, too, may they be that no one interferes with their sport when they can tell to a threepenny bit how much they may be out of pocket by it. I never see one of those hospitable notices, that "*Trespassers will be prosecuted, and dogs will be destroyed,*" but I fancy the sign-board reads strangely incomplete. Surely it should go on to say that—"*Parties can be accommodated on moderate terms on application at the lodge. A large stock always kept on hand; and orders executed with punctuality and despatch.* N.B. *The trade supplied.*" Do not suppose that I am over-stating this point; or, in case you should do so, let me give you the opinion of a country gentleman, a good sportsman, a practical farmer, and a member of the Council of the Royal Agricultural Society of England. I mean Mr. Antony Hamond, of Westacre, Norfolk. At a public dinner in that county, in the spring of last year, Mr. Hamond said: "The squires were fast degenerating into poulterers. Things were very different now to what they were fifty years ago. Game was then used as a means by which gentlemen afforded amusement to the guests with whom they filled their houses; and it was a very charming amusement. But, although some of those gentlemen who now hired shootings showed extreme liberality and kindness, yet still game had become a commercial affair, and he hoped that the system would soon end in a thorough bankruptcy." I think I hear a good many say "Amen" to that. But, still, "this is a free country." "A man may do what he likes with his own;" and what is it to you, or to me, or to Mr. Hamond, of Westacre, if my lord chooses to add to his income by breeding rabbits and hares for sale, just as the farmer does pigs and sheep? Unfortunately it has a great deal to do with it. If my lord would only follow this out, and mark his hares and rabbits on the side as the shepherd does his flock, so that when found straying we might pound them at once, the case would be something more of a parallel. As it is, such a plan would not be altogether so outrageous as some might imagine. A Sussex gentleman I met the other day, not a heavy game preserver, but who has a little quiet shooting of his own, gave me the following anecdote:—During the past season he killed a few fine fat pheasants, to which his cook called his attention, as all remarkable for having no back claw. He could not explain this at the time, but meeting the head keeper of a neighbouring establishment a day or two after, he began to tell him the story, as rather a curious fact in natural history. He had got no further, however, than "they were in famous condition, and had no back claws," when the other savagely interrupted him, with "Why, dang it! that was our toe mark! You've been eating my pheasants!" as no doubt he had. But such kind of compensation is not too common, and this glorious privilege of doing what you like with your own gets a little lop-sided, when it comes to do what you like with other people's own, too. Just at present the matter is in something of this state: My lord—or my landlord, as you please—has all the pleasure of shooting the game, and all the profit of selling it, while the farmer has the simple satisfaction of keeping it. When I was a lad, I have often ridden by a roadside house, at the top of Dashwood Hill, on the borders of Buckinghamshire, bearing the quaint old sign of "the Five Alls." There was "the parson who preached for all"—"the soldier who fought for all"—and so on, the category closing with "the farmer who paid for all." I am really afraid that estimable gentleman is distinguished by the same substantial compliment in this matter of the over-preservation of game. He pays dearly enough for the keep of it on his farm. He pays for the keep of the poacher in prison, and he pays for the keep of the man's family in the workhouse. Increased rates and taxes of all kinds speak to this; and it is not so much a question of how much the landlord gets by every head of game he sells, as how much the tenant loses? This is the point. To say that a great head of game, or rather of vermin, for I speak to hares and rabbits more particularly, do great injury to the surrounding lands, is to state a truism that nobody will now attempt to deny. But the worst of it is that the injury they effect is almost altogether incalculable. I believe if it could be really proved what harm hares do to farming, that the result would be something so astounding as to be scarcely creditable to those noblemen and gentlemen who have so long countenanced such a plague. Experiments have been entered on to show that one, two, or three hares, or even large rabbits, will consume as much as a sheep. This, though, has comparatively little to do with the actual extent of the evil. I shall prefer taking this on the authority of a gentleman whose name is well known to you all—the late Mr. Philip Pusey, at one time of his life a game-preserver, a President of the Royal Agricultural Society, and the Editor of the Society's Journal. He said, "Even if you ascertain that three or four hares do not eat more than one sheep, you could not estimate the amount of injury to a farmer by the food eaten by an equivalent number of sheep, because the hares are allowed to help themselves and to go everywhere where they ought not to go; and independently of that, the positive loss, the annoyance to a farmer who has cultivated his land upon improved principles is very great. It may be a question upon certain kinds of soil, whether it is an injury or not to wheat to be fed down; but still, as a farmer myself, I should like to have to decide upon it myself whether I would have my wheat fed down... It is an interference with a farmer's crops; and where a man has been taking pains with his land, and spending a good deal upon artificial manure, and endeavouring to grow good green crops, it must try his temper very much." And I think we may say his pocket, too. This was some years since; but all Mr. Pusey then advanced has within these few weeks been confirmed by another well-known agriculturist, Mr. Grey, of Dilston. I consider Mr. Grey an especially good man to quote upon this subject. As the agent of the Greenwich Hospital Estates in the North—a very extensive property—he may in some measure be supposed to side with the owners of the soil, in doing the best for it and carefully keeping its rights intact. On the other part, Mr. Grey himself is by education and inclination a practical farmer, still a judge at your shows, and amongst you at your meetings:—"I have never yet, where valuation and arbitration were resorted to, seen the farmer get one-half of what I consider he was entitled to. Look at the progress of a single hare. You see a hare enter a wheat field—you see him pick out a stem here and there in his course over the field; he will nibble an inch or two from this stem, and he does not stop till he has cut off a great many. It is not that the inch he has consumed has any appreciable value whatever; but the ear of corn would have been matured which the hare has prevented by cutting the stem off; and if you consider the damage which is done by one individual hare in a wheat field in one night, you will find that the damage done by these animals night after night comes to a considerable extent —it may amount to bushels an acre." Now, we all know how a hare travels. We see from what I have quoted how impossible it would be for a game-preserver to feed her and keep her in his own grounds, even if he were desirous of doing so. As long as there are "fresh fields and pastures new," young wheat, green tares, and sweet turnips, so long will the hare continue to dine out. Let us only try to conceive the mischief swarms of these animals must do; and to show how they do swarm, let us take the following extract from the Game-book of a nobleman, giving some of the sport towards the end of the year. Here are five consecutive days on the same manor. The party killed—1st day 178 hares, 2nd day 292, 3rd day 60, 4th day 195, 5th day 77; in all 802 hares in five days, as well as almost countless pheasants and rabbits. This is by no means a picked return, but really the first I came across. No man, indeed, can need now be told of the detriment to good farming arising solely from the over-preservation of game. The effect is not always so palpable at just the first chance; but only look to the lands lying under the covers and plantations, and go further in to see the hare-paths, and the terrible devastation that accompanies their progress. I have myself galloped through wheat on the very verge of harvest, on land in the occupation of a near relative of my own, where I was assured I could do no harm; in fact, the crop was not worth cutting, owing entirely to the game-preserving instincts of an adjoining landlord, who never paid a shilling to those who suffered so much from his propensities—who never gave them a head of game from his bag—and whose keepers were continually trespassing on other people's grounds to look up their game. I have seen these men frequently driving the hares and rabbits back into their own coverts from the fields they had been feeding on. Rabbits do not range so far; but where they are suffered to abound, it is simply ruin for the farmer to submit to them. They poison the land, as well as rob it of its present produce, while the way in which they increase is really incredible. I may here introduce a letter on the damage done by game, that I received after I had written the foregoing. My correspondent is an extensive occupier in one of the best-farmed counties in England; but farther than this I shall not care to identify him—"I shall allude to hares in the first instance, considering them to be the most objectionable; they are in the habit of congregating together, and may be seen as many as one, two, and three hundred or more in fields of from twenty to forty acres, feeding on the produce of the land, and I need scarcely say they prefer the best and sweetest herbage. Game abounds chiefly on light soils, and dry seasons greatly favour their destructive habits. The cereals being of kinder growth, and naturally of sweeter quality, it is here that irreparable injury is done to the growing crop, be it wheat, barley, or clover—constantly eating day and night, and all the year round, does it not become evident they must consume and destroy what would and should have been additional food for man and beast? But hares are so destructive to crops in the months of May and June: always on the move, they cut their way through the corn and clovers, and to such serious extent do they clear off roods, and in some instances acres together, that literally I have smelt the perfume arising from the withering influence of hot weather in those months. Independently of the loss just mentioned, which appears as it were sheer mischief, the corn thus prematurely cut off will attempt to grow again, and if some of it should be fortunate enough to get partially into ear, will always be so far behind the other portion of the field at harvest, as to greatly injure the sample of produce already diminished in yield. It may be considered a pretty and novel sight to see two or three hundred hares in an enclosure as we travel through the country, just as we view a herd of deer; but does it strike the beholder they are eating the farmer's produce? Is it just, I ask, that land capable of providing food for the country should be allowed, I may say, to be monopolised by game? Is it not sickening to the farmer, after his best endeavours, to see this sad destruction of his hopes and management, by consumption in excess of game? But let me be understood. There cannot like myself be a man, I am sure, but what delights to see the sudden start of a hare from his land, or has less objection to meet such on his table after legitimate sport. No; I am sure as "sons of the soil," we would never wish to see the extermination of game: it is the abuse I have endeavoured to expose, but fear I cannot fully express the very great amount of loss that is occasioned throughout the country from the great 'over-preservation of game.' Of course, game more or less must look to the land for its subsistence, and, like many of its productions, it forms, at seasonable times, a welcome addition to our epicurean appetites. Norfolk, Suffolk, Nottinghamshire, Lincolnshire, Yorkshire, Cambridgeshire, and Cheshire may be considered as special over-preserving game counties, and I believe it is a fact, that in spite of great vigilance, the poachers are known to carry off a large percentage of hares and pheasants and partridges, far more than is ever conceived by the proprietor, which at once demonstrates the folly of such extravagant hordes of game. Yet I believe there is a growing disposition to reduce this great evil to agriculture among landowners; late years have given us proof of much modification in this respect, and I firmly believe it would be carried out much more extensively, were it not for neighbouring preservers vying with each other to prove who can keep up and kill the most game. And to take another point of view: we know how difficult it is to eradicate a long-established prejudice. We are great sticklers for our own ideas, and to succumb or give way to change is always a tardy and unwilling act, nor can we do so without a certain amount of chaff which invariably follows as a matter of course. But for these obstacles, I believe we should find many of the great extensive game preservers reducing it to such a point as would create for themselves more *real* sport, and remove what is severely felt to be a great impediment to profitable and good farming. I am thoroughly convinced that the great amount of droppings as well as urine from these animals is of the most poisonous and obnoxious nature, and exceedingly detrimental to the development of wheat, particularly. We have all noticed, where such is made—hillocks being a favourite spot for deposits—that the herbage is bleached, or as it were scorched and apparently lifeless: from this we may fairly conclude how offensive such must be to vegetation. It may be said we must be aware of the character of our occupation, before accepting. We conceive we do; but it is only by experience that we gain any idea of the destruction that an over-supply of game will create. Looking over the hedge is one thing, and walking through your infested fields is another. It is there that strangers and others unaccustomed to game become at once astonished and disgusted with its effects. Hares are much attached to swedes, particularly in severe weather, and the amount they destroy is again greater in this crop than what is consumed; they do not confine themselves to a single bulb, but attack so many, and as soon as the opening is made, the crows, wet, and subsequent frosts complete the havoc. The only preventive in this particular instance is to pull the swedes and cover down; yet here we have an extra expense, and throughout the whole system of farming the cost of your preparation and following operations are equal to the occupation, free from such a tax as superabundance of game. We must not forget to mention, that with all cropping, from its early growth to maturity, an additional mischief is caused by the constant traffic of game, in breaking down the corn, which from want of air invariably proves abortive. Rabbits may be said to be less destructive than hares: the damage is local, feeding on the produce near their burrows, they to that extent crop off everything before them. They are extremely injurious to hedges: wherever we see an excess, there surely will be found dilapidated hedgerows: becoming so thoroughly undermined, a weakness is communicated, which ends in their dying away, or becoming thin and weak. Rabbits are very troublesome with underdrains, often running up the tiles, and not unfrequently becoming jammed on being pursued by vermin, they die there, and of course stop the water-course and occasion a vast amount of inconvenience. Ditches are continually filled with soil from their fresh earthings, and as far as their peregrinations go there is nothing but a complete annihilation of all vegetation. Everybody is aware of their greedy appetites, and the same remarks relative to their offensiveness to all productions is fully as strong if not greater than in the case of hares. Pheasants I cannot say much about; but there is no doubt, in Norfolk particularly, the loss in barley crops is in some lordships alarmingly extensive, feeding and treading down that grain, or if naturally lodged, they make it much worse; and then its close proximity to the soil renders it impossible to fill or mature beyond a weak and worthless grain."—My correspondent, you see, also dwells mostly on the injury effected by hares. In fact, the evils of rabbits are so apparent, that no man going into business with his eyes open should barter away his power over such pests of the farm. Indeed this is seldom insisted on. The feeling is commonly the other way. It is only a very sharp agent who stipulates for a right to "the coneys;" and the Legislature very properly regards them as vermin. At least, it did so until the appearance of Mr. Gladstone's budget, and the new sliding-scale certificate. On first hearing of this I was inclined to look at the diminution of price as a matter of but small consideration to the farmer, either one way or the other. It reads chiefly as a boon to the occasional sportsman, and as an effort to catch a few stray pounds by such a means. But, to our astonishment, we find this disciple of Progress, and champion of the great principle that men should go about their business as unfettered as possible, actually retrograding! Rabbits are to rank as game, again. No tenant shall under any circumstances destroy them without a certificate; and this in the face of a comparatively recent proviso that he should have a similar privilege for both hares and rabbits. The career of the present Chancellor of the Exchequer does not go to show that he had ever any very great respect for the interests of agriculture; but the coolness with which he now pushes the farmer aside, solely for a possibly paltry increase of revenue, is both a wrong und an insult. And what a commentary, too, on the agitation originated some years since by what is termed "the Manchester school" over the Game Laws, when we find their pet statesman doing more to perpetuate, or rather to revive the worst evils of the system, than anything that has been attempted in the memory of man. I do not at this writing believe that such a proposition can be acceded to; but if it is, we may well look round us, and ask where are "the farmers' friends"? However, game or vermin as they may be classified, the rabbits naturally bring me on to their sworn friend and protector the game-keeper. One loathes the very name of such an office. You must all know the authority he exercises—a power so much above his proper position in life; and that, as a rule, he proportionately abuses. To him the commonest act of husbandry is one of suspicion and distrust. He unites the invincible curiosity of our English Paul Pry with the malicious intent of a spy for the Inquisition. The farmer and his men are continually under his supervision. There is nothing they can do but it is his "duty" to overlook them. He stands by the mowers to see they do no harm to *his* nests. He struts into the reaping field to make sure they don't hurt *his* birds. The boy with his scare-crow, the shepherd with his dog, and the little lass with her kitten, are all alike the objects of his hatred and his tyranny. He has been known to wrench a gun from the hand of a farmer's son for shooting at a rat! He has told the farmer himself he should prefer his not firing at the birds on the corn, as it was "such a trouble to be always coming to see what he was after!" He has informed against a tenant, whom of course he was watching, when his victim got off and picked up a hare which his horse killed in her form; and a bench of magistrates at Newark positively followed this up with a conviction! To the disgust, however, of these Solons, the Commissioners of Taxes of course reversed the decision. He lays traps for the labourers, as has been proved over and over again; and rejoices, like another Jonathan Wild, or some other such a scoundrel, only in the downfall of his fellow-men. He is the very essence of evildoing. He whispers characters away in the ear of his employer; he swears them away more openly in Court. He is incessantly making ill-blood between man and man, and he is the one great blot on our fair English landscape. I have the experience of an old keeper himself to say that such men are rarely to be believed or trusted; and they are the greatest enemies to true sport that I know of. The rabbits are the keeper's perquisites; that is to say, the vermin which do the farmer the greatest injury are the animals above all others that the keeper has a direct interest in maintaining a stock of. The vermin which the law declares the tenant has a right to destroy as vermin, the landlord transfers as a right to his servant. There is, I am happy to say, a growing feeling against the fashion of perquisites, or of paying a servant by any other means than by that of his fair wages. If a gentleman pays his servant fair wages the man has no claim to perquisites; and if the employer does not give him his due hire, he can certainly with but little justice look to the farmer to make it up to him. But we hear still of head keepers clearing their two or three hundreds a year by the rabbits; so much gain to them being, as a rule, so much loss to the tenants. I have termed the keeper an enemy to true sport—to the finest field-sport this or any other country can boast of. How often have I seen pheasants darken the air, and hares and rabbits cross the steady hound at every step, as we drew the large-holding covers, one after another, without a challenge, or the sign of a fox! How I have marked the master and huntsman look significantly at each other when every bit of it was drawn "blank," and heard the latter call his hounds away from the swarms of vermin, with a certain kind of contempt in the tone of his cheery voice: "Come away, my lads! come away! we don't want any of them, do we?" And there, too, was sure to stand, at the other end of the cover, the jealous, lying, murdering keeper, reiterating that he "Can't make it out. There were three or four foxes here the day before yesterday; my lord will be so sorry to hear they didn't find;" and so on. "Come away! come away there!" is the other's only comment, as he draws his hounds by with a half-smile of pity that makes Mr. Plush, case-hardened as he is, fairly wince again. There is no greater self-deception, no finer piece of humbug, than a game-preserver allowing his keeper to sell the rabbits, and telling him, at the same time, not to destroy the foxes. There will be, of course, some men who do not exceed the proper duties of their office, nor exercise to the full the monstrous powers invested in them. It may, also, be urged that the employer is chiefly to blame; but, as Mr. Hamond tells us, "there are too many men who are the slaves of their keepers," and, as he adds, "the sooner they are emancipated the better." Game is well distinguished as of two great orders—Fur and Feather. In this classification the latter kind is thought to do by no means equal harm with the fur. Indeed the famous partridge shooting of Norfolk is said to be enjoyed at little or no cost to the farmer. Pheasants, again, are half-domesticated, and fed as regularly as poultry. They crowd round like Mrs. Bond's famous ducks at the chickabiddy cry of "Come and be killed!" Still occasionally they eat a vast deal of corn. No one who has seen them perched on the shocks towards the end of harvest can suppose their investigations at such a time and place are directed altogether to the extermination of the wire-worm. And I am assured that during the last season, on the property of a noted game-preserving nobleman in Suffolk, towards the close of an autumn afternoon, three-hundred pheasants were counted round a tenant's barley stack. I will not say exactly what purpose they were there for. It might, perhaps, have been a public meeting, called by some old cock, to take into consideration what effect the Chancellor of the Exchequer's proposition for a cheap certificate might have on the long-tailed interest; or, to devise some measures against the coming discussion at the Farmers' Club. However, it is a pretty general rule amongst us to wind up all such proceedings with a dinner, and I much question whether this influential gathering separated without partaking of some refreshment. The pheasants shall call the meeting, the Marquis will give the land to hold it on; and Mr. Martyr shall stand the dinner. But these birds do not confine themselves to corn. At a recent valuation on the Western line, for damages done by game, a shepherd declared that in the spring of last year he believed the pheasants ate as much of the swedes as his flock of sheep. Nevertheless, pheasants can be kept a good deal on their own ground, if they are only well fed; and, perhaps, the most harmless plan with them, if people must have a great bag, would be that adopted a short time since by a noble lord. He was going to shoot an outlying wood, in which he knew there was little or no game; consequently the keeper had orders to put some pheasants into it the night previous. They had a quiet time of it, and the poachers did not get at the secret. In the morning came my lord and his party—pretty good shots all of them—and famous sport they had; so good, in fact, that after lunch they wanted to go back to the big wood; but the keeper hesitated, and then explained:—"It was no use, my lord, going there again; they had killed a hundred and eighty-five pheasants as it was, and he had only turned down a couple of hundred!" This is fair enough so far; but even under these or worse circumstances, what is the finish of this fine sport? Where does the bag go to? A greater portion of it to the shop-keeper, to be sold against the farmer's beef and mutton. Let any one walk through Leadenhall Market during the season, or cast his eye round a country town, and see the amount of game exposed for sale, and the price it is offered at, and he may easily understand how seriously it comes into competition with the tenant farmer's more legitimate produce. Many such a man has to buy the birds, bred and fed on his land, of the poulterer; and a short time since I knew a gentleman, whose occupation is overrun with game, who bought a hare and a brace of pheasants here in town, just as he might have done a dish of fish, to take home with him into the country. The ramifications of my subject, the abuses and injustice traceable to the over-preservation of game, are almost endless. Let me endeavour to epitomise some of them. In the first place, the higher or the better farming, the more green crops, and so on, the greater the damage. The hare is an exquisite, who just tastes and tries, and then passes on, leaving the work of destruction either to the other offenders, or to gradual decay. Then, the greater the head of game, the stricter it is preserved, the more also will there be of other kind of vermin. This is an indisputable fact, and an old sportsman and a master of harriers that I met in the park a week or so since, urged me strongly not to pass it over. Keepers may profess to kill rats and hedgehogs, and perhaps they do when they can find them; but they destroy far more systematically the great enemies of such a class of depredators. They shoot the terriers that kill the rats, they trap the cats that kill the mice, and they wage war against the hawks and owls. The balance of nature is, as it were, upset; and only that the farmer should suffer more and more from such a revolution. No one who has lived in the neighbourhood of a heavy game-preserver but knows the difficulty there is to keep either a cat or a dog. A cat, though, that has once taken to poaching, is said to be ever afterwards but a bad mouser. I have reason to believe poor pussy is often positively enticed into mischief. There is a chemical called valerian, to the smell of which cats are amazingly partial; and should a bait be rubbed over with it they will come a long way by the force of such an attraction. We may make a tolerably good guess who is answerable here, just as we can for the hare in the wire, laid temptingly by the path of the poor man on his way home or to his work. As for dogs, if I recollect correctly, some disinterested and reasonable man once said, publicly, that a farmer had no business with any dogs on his place, and that the very shepherd's colly was an unnecessary nuisance, doing little more than disturbing the game, and calling his master's eye to it. But even beyond this, over what the tenant-farmer loses either by game or vermin, the system of over-preservation actually interferes with the proper pursuit of his business. There was a favourite clause in some of the Norfolk lettings, that an occupier should not drill his turnips nor mow his wheat. Drilling caused the birds to run, and mowing left them no shelter. I was in hopes we had been growing out of this. But it is only a year or two since that the tenantry of a nobleman in the Midlands were ordered not to employ a reaping machine! I do not know what Messrs. Burgess and Key, or Mr. Crosskill, would say to this; but the farmers of England are, I am happy to add, not sunk quite so low, and they successfully resisted so monstrous and so unwarrantable an interference. Still the direct effect of the system is to humiliate and to lower their spirits and energies. How can a man properly respect himself when he knows he is more or less at the mercy of an ignorant self-sufficient underling? How can he do his best, when he knows his best efforts will be eventually thwarted, and all he has done as continually undone? What pride can he have in an occupation where a keeper can report and direct him? And where hares and rabbits rob him alike of his credit and his profit? Game-preserving lessens the production of the soil, stays the full employment of capital, and mars the fair aim of industry and ability. The most offensive feature, however, associated with this question is that which arises when the landlord does not take the shooting himself, nor permit the tenant to have it. So long as a gentleman sports over his own property there is some hope. An accident may open his eyes to the abuse, or his own innate sympathies prompt him to a better course of proceeding. But let a stranger have the manor—a swell tailor from Regent-street, or a smart solicitor from Chancery-lane. What do such as these care for the tenant or his feelings, or his rights or his wrongs? What do they know of the old place or the old Family? They have simply hired the shooting, and they mean to keep as much game as they can. They are often heard to boast that they more than pay their expenses from what they kill—and sell. The bigger bully and blackguard the keeper the more they like him. He has the tenants in proper order. And picture an English tenant-farmer of this present era, with education, capital, intelligence and spirit to warrant his taking his proper place in society, having to submit to such degradation as this. To be patronized in his own home and before his own people by some cockney gent who will tell him, "'Tis fine times for you farmers!" and who "will see about it and hear what my keeper says," when you go, cap in hand, and ask him for a day's coursing. Again, I feel proud to say there are many above this, and who would never see a hare turned rather than thus prostrate themselves. But they feel the insult inflicted upon them—not so much by the stranger as by their landlord and his agent—at every step they take and every look they give. I have already referred to the well-known fact of how much the farmer suffers from poaching, as well as game-preserving. He pays for the one a terrible tithe in corn and roots, and for the other as heavy in rates and county expenses. At the first blush, it would seem that the farmer could have little to urge against the poacher, who only goes to relieve him of some of that excess from which he suffers so much. And really, under the circumstances, I do not think the tenants are very determinedly hostile to such trespassers. In simple truth, few of us are. Poaching is an insidious disorder. It gradually grows upon a man; and poaching itself is by no means regarded as amongst the higher order of crimes. We are all shy of engaging with a confirmed drunkard or a convicted thief, but the poacher's character is not so hopelessly gone. You may find many a man on a farm still, strongly suspected of a quiet taste for wiring a hare or bringing down a pheasant. But perhaps the finest proof that a poacher is fit for better things, is in the fact that he is often taken into employment as a keeper or watcher by those who of all others have been the most bitter against him. You must not suppose that I am upholding such practices.

I only wish to show that the common feeling of the country is apt to regard the offence as a very venial one. Robin Hood, one of the favourite heroes of our ballad minstrelsy, was, I fear, little better than a trespasser in pursuit of game in Sherwood Forest; and the great genius of this country—the master-mind of all ages—Shakespeare himself, had a warrant out against him for poaching over good Squire Lucy's domain. Do we think much the worse of him for this little passage in his early history? But I have termed poaching an insidious disease; and I have little doubt but that it reduces a man from worse to worse; habitual idleness, a passion for drink, hen-roost robbing, sheep-stealing, and even graver crimes have been not the unusual close of the poacher's career. The over-preservation of game injures the farmer quite as directly in this wise. It demoralizes his labourers tempts the best away from him, and renders them dissatisfied with and independent of a fair week's wages when they can get three or four pounds a night in the woods. At the time the last Game Law Committee of the House sat, now just fifteen years since, it was a very favourite argument, that the preservation of game employed a number of people. "Does not the country gentleman, fond of sport, keep up a large establishment?" "Are not a great number of men engaged as keepers and watchers?" Indeed, it almost seemed that the most politic thing to do was to tempt two-thirds of the surplus population to poaching, and then set the other third to catch them. But this crowning argument is worn out. We have little surplus agricultural labour now-a-days. Every man in the parish can be employed to a vast deal more advantage than as a watcher or beater, and gentlemen who fancy that by retaining these large establishments they are doing an immensity of good, cannot be too soon undeceived. One of the points of modern husbandry is the use of more labour, and we shall soon want all that we can obtain. Poaching, however, is on the decrease; or at any rate, the convictions are not so many. In 1843, a very heavy year, there were in England alone 4,270 convictions, and in 1859 only 2,608, the United Kingdom through. Up to the first period I have referred to, 1843, crime of this character had been strikingly on the increase. The gradual diminution may be ascribed to a variety of causes. Amongst the first of these is, that we have had less distress in the agricultural districts. From emigration and other collateral causes the labourer has been enabled to find a more ready market for his work, and has consequently had less actual need to sin. Then, the country magistrates have been rather more careful. That terrible instrument of torture, the Press, has been looking them up, and the word of a keeper I fancy scarcely stands for quite so much as it did. The Parliamentary Inquiry was no doubt conducive of some good. No one can go through that mass of evidence without being struck with the monstrous abuses and injustice associated with the system. This Commission unfortunately came at the wrong time, when the nation was in the heat of a great party battle; and it was, moreover, but indiscreetly conducted. In many quarters it was taken to mean nothing more nor less than another attack on the landed interest; and it certainly reads, with its cross questions and crooked answers, very like another passage of arms between the Manchester school and the Country party. The effect was so the least where it should have been the greatest. The squires and sportsmen received such evidence and the deduction from it with a certain prejudice and determination not to be thus influenced. Their "backs were put up" by what Mr. Bright said, or asked, or did, and they were not going to amend their ways at his bidding. Nevertheless, considerable improvement has taken place within the last ten or twelve years, and to this I chiefly attribute the decreasing number of game convictions. The temptation is being removed. It has been asserted that the more strictly you preserve game, the fewer poachers will there be. But this I do not believe to be the fact. A professional poacher will only go where it is worth his while, and the mere chance of a brace of birds or two would, in his own words, be "no use" to him. Let the preserves be ever so well guarded, we have only to go back through our criminal cases and newspaper reports to see how systematically poachers make up their parties to fight the keepers; when the greatest of all crimes, murder itself, has been committed, and men have been as recklessly sacrificed in this Christian country to the pheasant or the hare—shot, hung, or banished—as they were when the heathen, in his blind idolatry, offered up his victims to other birds and beasts. And now comes the grave question—How shall we remedy such a state of things? Does not the tenant take his farm with his eyes open? Is not the game in the first instance his own property, without he chooses to sign it away? Has he not a right to destroy the hares and rabbits until he consents to a clause to the contrary? What, in the face of all this, can be done? Abolish game and the Game Laws altogether? I for one should be very loath to see any such a measure attempted. Enact, then, that a man should never take a farm without having the game with it? I fear this is equally impracticable. In fact, I do not trouble the legislature at all—that is, of course, assuming this impertinent proposition to rank rabbits as game be given up. But I seek audience at once with the landlords, and I ask their agents and advisers to accompany me. I say the farmers of England are not enemies to sport; on the contrary, they like to see the gentlemen enjoy it. I say that they do not object to a fair head of game; but that, as a body, they would readily maintain it. On the other hand, I say that battue shooting is not sport, and that systematically rearing a large quantity of game, and, then, as systematically selling it, is slowly but surely lowering the character of the English gentleman. Let the owner and the occupier learn to rely more upon each other. Let them free themselves from the thraldom of that officious, earwigging, scandal-carrying, mischief-making keeper. Let the landlord address his tenantry as a noble Duke, whose family name stands high in the annals of agriculture, did some years back when he gave up game-preserving:—"Now, gentlemen, I mean to make you my keepers, and I hope when I come you will be able to show me some sport." Need I add, that hope has never been broken, and that no one has better sport, and that no man stands better with his tenantry or with the country than his Grace? As a further example of how this can be done—how a good supply will be kept up by the farmers—let me turn for a moment to that voluminous inquiry, and give you a passage from the evidence of Charles Shirley, Esq., a magistrate of the Western Division of Sussex, and Deputy-Lieutenant for that county. He says—"Before I came into Sussex I was a game preserver in Warwickshire, upon the estate of Lord Digby. I could not afford to spend much upon game preserving; but at that time I had as good shooting as ever I could wish, and it was preserved entirely by the tenants themselves upon Lord Digby's estate of 8,000 acres. I had only one person that I could call a game-keeper. I was dependent entirely on the farmers for my sport; and the great difficulty I had was to prevent getting tipsy with their strong beer and pork pies, which they brought out to me in the field—they were so hospitable. They treated me so well that I never would shoot a hare to interfere with their coursing. They had the right to kill both rabbits and hares by coursing. In my whole life I never knew such civility and kindness. They marked for me, and the shepherds and labourers had strict orders to keep off intruders of every kind. I am very fond of shooting and hunting. I never sold any game in my life, and I do not like the system of selling game. My amusement is shooting with my own dogs, and walking. I have shot only two or three times at battues, and I do not like it. A few years ago I was with Lord Suffield, who is my brother-in-law, in Norfolk; and for two or three days there was battue shooting; we were ten guns; I think there were about four guns at each bird, which I did not like; and each man had his servant behind him, who scored the bird to you or to me; so that at the end of the day there was a vast number more heads of game killed than were in the bag." I call that the speech of an English gentleman and a true sportsman; and it is on such testimony I should like to act. A word or so now to the agents and managers of estates. We are living beyond the time when it was only thought right and proper to bind a man down by all sorts of fines and covenants as to what he should do, and what he should not. But I believe it is still thought rather knowing to keep as tight a hand as ever over the Game. There are some sharp agents even now, who make it a point to reserve the right to "the coneys", as they are called. But beyond this they are too apt to stand aloof in the matter.

It is a delicate question they do not care to interfere with, and so they leave it to the squire, and the tenant, and the keeper to settle amongst themselves. Great people, however, it is said, often find it a difficult thing to hear the truth, and in this case they should hear it far more frequently from those who act for them. Is an agent doing his duty when he witnesses in silence a tenantry half ruined by hares and rabbits? and who knows his employer is ridiculed and abused, if not cursed outright, at every Farmers' Ordinary in the country? Within the last ten years or so I have been over the greater part of the United Kingdom. In doing so I have mixed continually with the agricultural classes, and I say advisedly that these heavy game preservers are marked men. A ten pound prize for the best bull, or a fine speech at a full meeting, can never outweigh the abuses they sanction, and the injustice they commit. The agents often know this better than their employers; and if any great landowner and great game preserver should do me the honour to read this paper, I only trust that he will at once summon his right-hand man before him, and ask "if there is any truth in all this?" The damage the hares and rabbits do to the landlord's own property—the way in which they strip his trees, and ruin the young ash and other timber, comes scarcely within my province. Here a man may clearly do what he likes with his own. A rather startling anecdote, though, will show how far this kind of thing may be carried. A nobleman near London has recently given a tenant of some two or three hundred acres or more notice to quit, solely from his keeping up too great a head of game. It is only right to say that the occupier is not an actual farmer. By profession a surgeon, he has united with this the pursuits of amateur farming and game preserving; and putting the three together, has, it appears, contrived to do a deal of destruction. A friend, however, in Essex favoured me on Saturday only with what he well terms "a practical fact" on this feature of the case:—"I have lately been over some hundreds of acres of woods, valuing portions of the underwood for sale, and I believe I may fairly state, that the woods where hares or rabbits are overabundant, are damaged to the extent of nearly one-third in value. That is, in woodlands of fair average growth, and but little game, the underwood will average £16 per acre; but where hares or rabbits are much cared for, from £10 to £11 is the outside value of it." To the landlord then we look, and what is he to do? In the first place let him be content with real sport instead of wholesale slaughter; and let him fairly try the experiment of turning to the farmers to provide this sport for him. Let him break up his bands of watchers and keepers; they are required for better uses. Let him on principle give the tenants the right to destroy the rabbits "anyhow," and to course the hares. Above all, he must not let the shooting over the tenant's head. If he does not care for it himself, let the other at least be consulted. I know there is a certain kind of hesitation in some quarters as to letting the farmers have the shooting on any terms; but we are getting beyond the time of serfs and slaves; and I say decisively that some of the worst cases have been where a stranger has hired the shooting after, perhaps, the occupier has been for years in comparative quiet. It is then the mischief begins. But I have already dwelt on this point, as well as on others, which I shall now leave to your further consideration. To the landlords alone I believe we must look for the remedy, and that is neither unreasonable nor unprecedented. In fact it is fast coming, and those who still hold hold out will be better, or rather worse and worse, known. It is now nearly two years since I first put this subject on our list, and many members will bear me out when I say my anxiety was not so much to associate myself with the question as to see it fully discussed by the Club. However, I have now encountered it, certainly without fear, and I trust without prejudice. My earliest and warmest sympathies were with a sportsman's life; my later career has been directly associated with the interests of agriculture, and I have here essayed to show how you may steady the balance between them.

Mr. E. B. ACTON (the Temple) said he felt great hesitation in rising, after the interesting and eloquent essay of Mr. Corbet. He was glad that the committee had appointed the question for discussion, as it involved great anomalies and iniquities as regarded both the tenant and the labourer. Still he must say that, although the game laws had their abuses, they also had their uses. There was a vast quantity of land, more especially in the districts lying east of London, which was increased in value by the preservation of game. There was a peculiar sort of soil which suited game, and which game did well on. That the over-preservation of game was bad alike in an agricultural, legal and moral point of view, no one could doubt who had paid any attention to the matter. The destruction committed by a bevy of pheasants who came down on wheat in wet weather was awful to contemplate (laughter); and five hares were known to eat as much as one sheep. Legally, however, farmers had a right to compensation for damage done to the crops by game, and it was their own fault if they did not enforce it by stipulative claims ("Oh, oh!"). Was he to be told that under a lease the tenant-farmer could not obtain compensation for excessive game-preserving, with the damage which it inflicted? ("No.") He was of a different opinion. He had heard of a case in the North of England in which a farmer received £500 as compensation. The question must not be argued in a one-sided way; they must regard it in a legal as well as in an agricultural point of view. Morally the over-preservation of game did a great deal of harm. He once witnessed a battue in Richmond Park, and he assured them it was one of the most fearful sights he ever saw in his life owing to the number of wounded birds (laughter). A number of royal personages were firing away at game which seemed to have been driven into the enclosure on purpose to be killed. The unfortunate pheasants never rose at all. It was a complete game-butchery, and he must say that such things tended to demoralize the lower orders of the people. [A voice—"You mean the higher orders" laughter.] He had no objection to that alteration. In his opinion there was not much difference morally between the lordly battuer and the prowling poacher; they were both enemies to the good order of society, and promoters of a great social evil.

Mr. WILSHER (Welwyn) said the last speaker seemed to think that the farmer might remedy the evil by the terms of his tenancy. He denied that that was the case. If a person who was in treaty for a farm demanded the game, it would almost invariably be refused. In his own county, or at least for many miles round his own locality, no farm could be taken with the game.

Mr. J. CRESSINGHAM (Carshalton) said, having preserved game for the last thirty years, he had so managed as to reconcile the farmers concerned to his manner of preserving, and he had never had any complaints made against him of injury done by the game. If the game injured the farmer he had a remedy at law, no matter whether the injury arose from rabbits or from hares. He could have a surveyor, a properly-authorized man, employed to estimate the damage, and the landlord would be liable to the extent of the award.

Mr. WILSHER: How long after would the tenant continue to occupy the farm if he had not a lease? (Hear, hear.)

Mr. CRESSINGHAM continued: He did not think tenants were debarred from seeking reimbursement for damage done by game, by any clauses which might be inserted in a lease. The law was always open to them, and they might obtain redress for injury proved to have been sustained.

Mr. Alderman MECHI thought Mr. Corbet went too far in saying that hares and rabbits were acting by day as well as by night As soon as daybreak almost every hare and rabbit, he believed, went to its form, and sat there till the day was over, when it went forth in search of food. Again, he thought Mr. Corbet was wrong in saying that game did more harm on a highly-cultivated farm than on a poor-cultivated one. He believed the reverse to be the fact; and what he would recommend his friends who were troubled with an extraordinary quantity of game to do, was to farm twice as high round the wood as they did anywhere else. Complaints were made, and very justly, of hares and rabbits biting the swedes, and of the injury which ensued during the subsequent frosts. As a precaution against that evil he would recommend gentlemen present to imitate his friend Mr. Viall. On the 10th of November he found that gentleman carting his last load of swedes, and the crop was covered with earth, so that neither hares, rabbits, nor frost could injure it. Many thousands of pounds had no doubt been lost during the last season through the neglect of that practice. If he had to pronounce an opinion on Mr. Corbet's paper as a whole, he should say that it was too-highly coloured. They all knew that there were cases in which young landlords, actuated by a spirit of rivalry, preserved an enormous quantity of game, in order to have one day's shooting in the year; but that was a juvenile folly, and was not to be taken as a specimen of the whole. He believed it was quite possible for a man to keep a good head of game, and yet be on the best terms with his neighbours. Some years ago he himself had the shooting of a farm of nearly one thousand acres, about a dozen miles from London, and his neighbours very kindly placed at his disposal one thousand more. What course did he pursue? In the first place he took care that all his neighbours should have plenty of the game which he killed; he took care that they should have the option of having a pleasant day with him. Then, there being a very large quantity of rabbits, he used before the harvest to leave it to competent persons—men who enjoyed the confidence of their neighbours—to say what damage had been done, and the result was that he never paid more than £16 10s. in one year. Had he pursued a contrary course; had he refused to allow his neighbours to participate in the shooting, and shown a determination to avoid making compensation for damage, he would not have received such manifestations of kindness as he did. He believed that the ill-feeling with regard to the preservation of game arose from want of a due regard for other people's interests, and the grand point was to act in such a manner as not justly to excite feelings of that kind. Gamekeepers, of whom Mr. Corbet had drawn such a gloomy future, took their cue in a great degree from their employers. (A voice—"Not altogether.") Well, he did not say altogether; but they had to consider that question in a broad and national point of view. He thought there had been an improvement of late years as regarded game. There were, he knew, certain districts which had been called "game districts"—such districts, for example, as Suffolk, where at one time it was customary for the landlords to stipulate in leases that the tenant should not plough within a certain number of yards of the fence, lest he should disturb the game. But even in such districts as those a great improvement had been taking place, and there was now by no means the extraordinary amount of damage done that there was formerly. One proof of this was to be found in the fact that woods were rapidly disappearing, proprietors deeming it better to let their land at 25s. an acre to an improving tenant, than to preserve a large quantity of game. There were districts in his own part of the country where it was now difficult to find a cover to put a fox into (laughter). He quite agreed with Mr. Corbet as regarded the evils of excess in game preserving; but on the other hand, allowance must be made for people's hobbies, and the hobby of game preserving might be ridden without the injury either to the interests or the feelings of farmers, which had been so powerfully described that evening. He also concurred with Mr. Corbet that it was a great mistake for landowners to allow their gamekeepers to have the rabbits as a perquisite, that being a direct premium to them to encourage vermin. On the other hand, he would suggest to tenants that they should take care to well guano the land in the immediate vicinity of the park or preserve. The animals would not go so far afield for a sweet bite if they could get it near home. In conclusion, he trusted that that discussion would tend to bring about a better state of things as regarded the preservation of game, and that the remarks of the introducer would make a proper impression on that class of persons who gratified their own wishes, without at all regarding the interests and feelings of their fellow-creatures.

Mr. Parkinson, Jun., (Notts) said, as regarded the accumulation of vermin of which Mr. Corbet spoke, he would refer, by way of illustration, to an estate in Nottinghamshire. On that estate, which was highly preserved, and which belonged to Lord Chesterfield, it was no uncommon thing for the rats to take a row of wheat the whole length of the field; and the damage caused by rats, in consequence of the preservation of game, was almost equal to that which was done by the hares themselves. Another illustration of the same kind was afforded in the same county. Some time after the Langar estate of the late Lord Howe was purchased by Mr. Wright, having known it previously, he was surprised at the improved vegetation in two or three of the grass fields; and on his enquiring the reason, the reply given was that the ground formerly was poisoned by hares and rabbits. Mr. Mechi had recommended the application of a large quantity of guano to the land adjacent to woods. He had seen that experiment tried, and what was the result? The damage done by the animals was at a distance, and the acre near their home was comparatively neglected. He was too good a sportsman to wish to see all game destroyed, but he must say that when preservation was carried on without proper consideration for others, it became a fearful evil.

Mr. J. A. Nockolds (Stanstead, Essex) said, as a land agent he had always advocated the destruction of rabbits by the farmers after the 2nd of February, and until pheasants and partridges had begun to lay (A voice: "All the mischief is done then). On most estates where there were leases under his supervision, farmers had a right to kill rabbits at all seasons of the year. He could not help remarking that wherever he had seen farmers placed in the position of owners of the soil as regarded game, he had found them most strenuous preservers. When a person was observed riding with the hounds over young seeds or wheat, the reply to the question "Who is he?" it is almost sure to be, "It is Mr. So-and-so riding over his own farm" (laughter). He thought that, wherever shooting was let, the first offer should be made to the occupiers. That was a principle which he had always advocated.

Mr. Copeland (London) had witnessed the evil effects which arose from the practice of letting gamekeepers have rabbits as their perquisite. Under such a state of things, the gamekeeper, of course, took care to keep up a good stock of rabbits; and there was continual quarrelling between him and the farmer. He agreed with Mr. Corbet that it was absolutely necessary for the farmers to make a determined stand against the proposed alterations of the game-law. It would operate very inconveniently. For example, a farmer might take out a licence to kill rabbits; but that would not be enough, for every labourer whom he employed to track or ferret rabbits must have a licence too. That appeared to him a most important consideration with reference to the impending change.

Mr. G. H. Ramsay (Newcastle-on-Tyne) said, while admitting that their friend Mr. Corbet had treated the subject in a very attractive manner, he must declare that, in his opinion, his argument fell short of his language. Farmers had the laws of the country to guide and protect them, in relation to the preservation of game. Formerly, a man with £100 a year might shoot with impunity; but the game-laws had recently been modified, and made laws of trespass. No man could now come upon their land, trespass on their corn, their turnips, or anything else, without being amenable to the law; and he would ask farmers whether they wished that law to be abolished. The farmer took his farm knowing that there was a certain quantity of game upon it. If the landlord increased the quantity, the tenant would have a right to complain, and the landlord would be liable to pay damage; otherwise, the matter was one of fair bargain and arrangement between the two. All those figurative arguments on the subject went, in fact, for nothing. The late Mr. Pusey remarked that three or four hares ate as much as a sheep. He seemed to forget that the hares themselves were eaten; that what they consumed was not all thrown away. As to hares and rabbits being poisonous to the land, why, they all knew that, if different animals ate the same kind of vegetable food, whether they were hares or what not, the quality of the manure must be similar. Mr. Corbet had quoted the opinion of Mr. Gray, who had always been a warm advocate of the farming interest. That gentleman did not, in the speech which was referred to, say a word about trespass: his remarks had reference to the propriety of making tenants the offer of the game. If a farmer came to him (Mr. Ramsay), as a magistrate, and complained of trespass, he was bound to administer the law. The grand point was for farmers to take care that they made a fair and reasonable bargain with the owners of the estate. It was useless to abuse the poor gamekeepers, who were set to perform a certain duty; you might just as well abuse the policeman. The matter was one of bargain between landlord and tenant, just as much as the taking of a shop; and he hoped the day would come when it would no longer be supposed that such persons must act on different rules or principles from those adopted by other people. The over-preservation of game was no doubt a great nuisance. He was one of the oldest sportsmen probably in that room, having had a licence forty-six years, and no man could detest battue shooting more than he did. But he must repeat that for the excessive preservation of game the farmer had a remedy. The other day a farmer in Northumberland obtained an award of £60 for injury, and others who were similarly situated might have like redress.

Mr. Fisher Hobbs (Boxted Lodge, Essex) expressed his best thanks to Mr. Corbet for the manner in which he had introduced the question to the notice of the Club. He felt, when the subject was proposed to the Committee, that it was one that required delicate handling, and he really thought he might compliment Mr. Corbet on his mode of treating it, and his not painting the evils of game-preserving in colours that were too high. He (Mr. Hobbs) had himself been the occupant of a game farm for 13 years, and had had some little experience of the damage inflicted by game; for surrounding a considerable portion of the arable was a large extent of woodland, and he must say that his crop were greatly injured by the game. This farm had been in the hands of the owner; had been farmed high, and upon which the game had been preserved. A promise was made that the game should belong to the tenant; but like many other verbal arrangements in that day—and he feared it was also too much the case in the present day—the promise was not fulfilled. The fact was that landlords, generally speaking, did not like to tie themselves down to any contract with regard to game; he was acquainted with several districts in the kingdom where there were large tracts of land for which, if the farmers were ready to pay 10s. an acre for the game, the landlords would not let them upon principle. Last year he had the pleasure of a day's shooting in Surrey, where he witnessed what was termed a *battue;* a friend who was present, Mr. Ramsay, who unfortunately was hit hard by some stray shots, could not help exclaiming that he had never seen anything of the kind before; and if that was a *battue,* all he could say was that he much preferred taking his dog and gun into the turnip field and finding his game for himself. He was glad to see his old friend, Mr. Hudson, of Castleacre, there in the room, who, he believed, had as good partridge shooting upon his farm as any man in England; and if landlords generally were to offer the same terms to their tenantry as the Earl of Leicester did to his, there would not be half so much injury done to the land, whilst complaints on the part of the farmer would be very seldom heard. The *battue* system, however, had inflicted injury upon occupiers in a way that was not fully understood. It was the custom for gentlemen to keep keep game-books, in which were entered the results of each day's shooting; and about Christmas shooting parties were formed for the purpose of making a great bag. The consequence was that of the game which had been preserved during the autumn one-third would be cleared off between the keepers and the poachers; the result was that the proprietor did not find what was reared upon the land. In his own neighbourhood, a short time ago, pheasants were being purchased by the labourers and others at 1s. a head, partridges at 1s. a brace, and rabbits at 6d. a-piece. Of course, all these had come through the hands of poachers. He believed that farmers would be rather pleased than otherwise to be the means of maintaining a good stock of game, provided they were allowed to do so upon a liberal system; and an arrangement of the sort would no doubt tend to promote a different feeling from that which now existed between landlord and tenant upon the subject. Allusion had been made to the alteration which the Chancellor of the Exchequer proposed to make in respect of game licences. Tenants who hold under a lease are permitted, under a late act of Parliament, to kill rabbits without a licence; and he did think that such an absurd measure as that which was now contemplated could never pass into a law. If, however, a small licence were charged on every person who did not pay for a game certificate, who hunted with hounds, the hunt would become much more respectable and select than it was at present; there would be a less number of itinerant store-dealers and butchers' boys and others riding over the fences, and the revenue would at the same time receive benefit. In conclusion, Mr. Hobbs expressed a hope that Mr. Corbet's paper and the discussion combined would not be without an influence in bringing about an improvement.

Mr. Hudson (Castleacre) said: I regret I could not hear all the excellent paper just read by our friend Mr. Corbet; and although I agree with him in many points, there are some with which I may beg to differ. I am an old sportsman, and like the crack of the gun as well as the crack of the whip; and I should be sorry to deprive the country gentlemen of their sport. We, the tenant-farmers of England, do not wish to drive them in the autumn to smoky London or gay and sunny Paris; we wish to retain them at home, where they can do so much good by spending a large portion of their income, and receive their friends at their country-houses. But then they must have some amusement. They cannot very well offer their friends a bag of marbles to play with; but if they can give them a mount, and show them a fox one day, and give them a good day's partridge-shooting the next, and then a day or two through the covers amongst the pheasants, they may make a jolly week of it, and their friends will visit them. The poor people in the village will also reap some advantage after the great dinners at the hall. Let us do all we can to induce the landlords to live amongst us; let us endeavour to preserve the winged-game; but let us condemn the over-preservation of vermin—rats, rabbits, and hares. I am myself a small landowner, as well as a tenant farmer; and as one of my estates is suitable for rearing game, I keep a good stock upon it. There are 700 acres. 500 acres are let to a very respectable tenant; the remainder I keep in hand, and I farm all the land by the cover-side. For the last five years that I have had this, I have grown from 36 to 40 bushels an acre of wheat, and from 40 to 50 bushels an acre of barley, by the cover-side; so the game has not done much damage to my crops. My game is killed early; and on the 5th and 6th of last November my farmer-friends and myself killed 560 pheasants, 70 to 80 brace of which I gave to my neighbours and friends. I do not know whether our friend, Alderman Mechi, keeps a large head of game at Tiptree; I know him to be a keen sportsman. At any rate, *his* game has not done much damage to his crop; for it is in print that he has made £600 a year profit as landlord and tenant upon his little farm of 170 acres at Tiptree. Now, gentlemen, I believe you would all be satisfied if you could make 20s. an acre profit these times, with wheat at 42s. a quarter. This would leave above 50s. an acre for Landlord Mechi. Verily, I think Landlord Mechi gets the *lion's share!* I should like to take a leaf out of the worthy alderman's book; for I have a small farm in Norfolk, of 450 acres, let to a good tenant at about 30s. an acre, worth 50 per cent. more than Tiptree. Where I live—Castleacre—as my friend Fisher Hobbs has told you, is a good partridge manor, perhaps one of the best in Norfolk, and my excellent and noble landlord is kind enough to let me the shooting; indeed we, the tenants upon that estate, all hire the shooting upon our respective farms. Mr. Corbet has mentioned the name of Mr. A. Hamond, of Westacre, whose land adjoins mine. He is a first-rate country-gentleman, and an old fox-hunter. Fifty years ago my father occupied a large farm upon that estate, where the Swaffham coursing meetings were held; and there I first learned to hold the plough. The Norfolk Hounds met at Mr. Hamond's the last week in January, and the Squire gave a hunting-breakfast to about 150. I was there, and my son, and my grandson—three generations of us. We had a good day—four foxes on foot at one time. Well, we three went the next day to shoot with an old friend of mine, with whom I have shot for forty years; and the boy wiped the old governor's eye, and the old man was as pleased as the boy. Then there is another acre—Southacre—the plague-spot in the district. It is no uncommon thing for the party there to shoot 400 or 500 hares in a day, when they shoot those covers; and as to the rabbits, they are sent to Sheffield by half-ton and ton at a time. If the worthy alderman likes rabbits and onions, he may have plenty when he goes to Sheffield, to look after his establishment there. But if a fox goes to Southacre, he gets his toes nipped. The game-preserver there is the clergyman, the brother of the owner of the land; the place swarms with vermin—rats, rabbits, and hares. I hope we shall finish this discussion by saying, Preservation to the game—pheasants and partridges; but destruction to the vermin—rats, rabbits, and hares.

Mr. THOMAS (late of Lidlington Park) said that having listened very attentively to Mr. Corbet's paper he must declare that it contained nothing which he disapproved or which appeared to him to go beyond the mark. Other gentlemen in attacking it had introduced the game-laws, the right of trespass, and other irrelevent topics; but they had not refuted what Mr. Corbet said in dealing with the real question before them. (Hear, hear). They had been told by Mr. Ramsay that they ought to obey the law. He replied that there was a time when anyone who killed a hare or a rabbit lost his ears, but it did not follow that the law was one that ought to be maintained. All laws were not immaculate; otherwise, perhaps, there would not have been so much agitation to obtain the repeal of many of them. He agreed with Mr. Hudson that hares, rabbits, and rats should be put in the same category; and as regarded legitimate game, all he desired was that a fair arrangement should be be entered into between landlord and tenant. He believed that the best arrangement would be for the landlord to make the tenant his keeper, with the understanding that he would expect every year to have some good shooting. All asperity would then cease, a better state of feeling would spring up with regard to game, and they would get rid of a class of men, thirty years' experience of whom enabled him to testify that Mr. Corbet had not coloured his picture too highly. The hardest case of all, perhaps, was that of the shooting being let to a cockney-sportsman, a grievance which paralysed all energy, and extinguished all hope.

Mr. S. SIDNEY (Kensington) said three views were taken of this question. The first was that of landlords, like the late Duke of Marlborough, who thought that all such persons had a right to do as they liked with their own; the second was that of persons who concurred in the opinion of Mr. Bright, that all game was to be regarded as vermin, and as such ought to be destroyed; the third view was that expressed by Mr. Shirley, in the remarks quoted by Mr. Corbet, and supported by the evidence of Mr. Alderman Mechi, Mr. Hudson, and even Mr. Ramsay. Mr. Corbet had set forth the results of carrying out the only rational view clearly and effectively, not less effectively, because his paper was sarcastic, comic, and amusing. On such a subject ridicule was the effective reformer, for which all persons connected with agriculture were deeply indebted to him. It was, no doubt, essential to the welfare of the nation that gentlemen should be living on their estates, and the preservation of game was one inducement to them to do so; but, on the other hand, tenant-farmers were not to be sacrificed to the gross abuses of the *battue* system.

Mr. CONGREVE (Leamington, Hastings) said that as no one had spoken from the midland counties, he must express his approval of all Mr. Corbet had said, and he was of opinion that if landlords in his part of the country would give their tenants what Mr. Hudson very properly characterised as vermin—namely, hares and rabbits—the tenants would be most happy to do all in their power to preserve legitimate game.

Mr. BULLOCK WEBSTER trusted that the circulation of Mr. Corbet's excellent paper would produce a good effect on the agricultural community generally; and suggested that means should be taken to give it far more even than the usual publicity.

The CHAIRMAN said at that late period of the evening he should not attempt to do anything beyond congratulating the meeting on the very able paper read by Mr. Corbet. As regarded the discussion, although there was great difference of opinion on various points, the speakers all seemed to be united in this—that if there were a proper understanding between landlord and tenant with regard to game, the preservation of game, instead of being a source of ill-feeling, would tend to cherish mutual feelings of regard.

Mr. CORBET really thought that in reply he might simply read his paper over again. There was nothing to answer. However wide some gentlemen might seem to start from him, they all came to agree that the over-preservation of game was a great evil, and that the maintenance of fair field sport was highly desirable. What, for instance, could he wish for more than the testimony of the gentleman who sat by his side, and the first farmer in England—Mr. Hudson, of Castleacre? Mr. Hudson upheld the shooting of winged game, and still more so fox-hunting; but he denounced rats, rabbits, and hares, in one sweeping condemnation, as "vermin." As for other speakers, such as Mr. Mechi, who had appeared to differ with some of his points, they had been so ably answered by other members, that he (Mr. Corbet) should not take up the time of the meeting by any further dwelling on them. But Mr. Cressingham, a very mild game preserver, and if he recollected right, somebody else, had said that farmers had a legal claim by action or otherwise for any damage done. He (Mr. Corbet) could repeat not merely his own opinion, but that of some of the best land-valuers and agriculturists in the kingdom, that it was next to impossible to ascertain or award anything like due compensation for the continuous injury inflicted by the over-preservation of game. After all, however, the best compliment paid his paper had been the speech of Mr. Ramsey. If nothing could be said more for the contra case case than this, it must be weak indeed. Mr. Ramsey had referred to his (Mr. Corbet's) "figurative language," but he should put this not as "figurative" but as facts to the farmers of England. And he should leave them to compare with it Mr Ramsey's disquisition on the law of trespass, his sympathy with that "poor man," the game-keeper, "who only did as he was bid," and other such arguments. He (Mr. Corbet) would only further express a wish that the meeting should pass no formal resolution, but leave the club and the country to draw its own conclusions from what had been said.

On the motion of Mr. Wilsher, seconded by Mr. Alderman Mechi, a vote of thanks was given to Mr. Corbet for his able paper. A similar acknowledgment to the chairman for presiding terminated the proceedings.

THE OVER-PRESERVATION OF GAME.

SIR,—Englishmen are bred sportsmen; it is a part of our very breath and being. We take to field sports as naturally as ducklings to a horse-pond. Even our mimic games of childhood are a representation of the sterner sports of after-life. Our earliest schoolboy holiday enjoyments are associated with the bird-trap, the fishing-rod, the rat-hunt, and the rabbit-course. In after-years, as youth glides onward into manhood, to sport well, to rank as a first-class sportsman, to knock down a bird with style, to take "a right and left," and ride to hounds with pluck, judgment, and skill, are aspirations and attainments which rank amongst our highest flights of ambition. Even as hoary age creeps upon us, we are true to our first love—sport! and with joy we recount o'er and o'er the deeds of daring, the casualties and successes, of a past experience. Whether in the prime of youth or in the decline of manhood, no theme is more acceptable than the national sports of England. We delight to talk of their effects upon the national character, on their use and *abuse;* and even the committee of the London Farmers' Club resolved to put aside the sterner subjects of debate for one evening, to consider the game question.

Next to a good subject, the grand essential is a good man to talk about it. In this the Club was singularly fortunate. They wanted a sportsman, and a man of business—a man of talent, prudence, and independence, and one, withal, well up in his subject. They chose Mr. Corbet; and ably, on Monday evening last, did he sustain his previous reputation. He even won fresh laurels; and his name will long be associated with the exposure of the *abuse* of game-preserving, to his own credit and to the honour of the Club. It was necessary to draw public attention to this subject; and whilst Mr. Corbet was both happy and at home, and even racy in treatment, he wisely discriminated between the advantages of true and legitimate sport, and the evils of gluttonous excess in preservation—an excess which makes our country gentlemen mere game-butchers and game-hawking poulterers, their system a curse to their neighbourhood and their age, subversive alike to good feeling and good farming, and obstructive to fiscal and social progress.

Mr. Corbet is "one of Nature's sternest poets, yet the best"; and many a devotee to the battue will sink into his shoes under the truthful ridicule in which Mr. Corbet has wisely invested his whole procedure; whilst thousands of true sportsmen and intelligent farmers will say, "Well done, Corbet!" and confirm every statement with "That's true to the letter." We never remember a more faithful exposure; we have seen the whole sad farce enacted year by year. The landlord abused, the tenantry discontented, the gamekeeper a spy and a pest, the labourer tempted; and all for what? three or four days' butchery—sport is too noble a name!

Is it for this that English gentlemen will stoop and demean themselves? for this they will sacrifice the respect of their fellow-man, and gratify—at the expense of honour, of honesty, of morality, and progress—a selfish and depraved taste? Public abuses die out under public contempt, and we know of no evil more pregnant with mischief. We have seen magistrates the receivers of stolen goods—egg buyers; gentlemen the intimate companions of keepers and watchers; tenants with characters traduced, crops consumed, and no redress; and labourers seduced to evil by the high premium placed upon success in crime—viz., "Pheasants'-eggs bought here at 12s. per dozen." We heartily recommend the perusal of Mr. Corbet's paper to every thinking man; and as it was received with hearty applause at the Club, so will it be welcomed by the community at large. Englishmen love true sport—they detest the abuse and the abuser; and whilst we seek a remedy from a crying evil, we desire to respect the rights of the owner, to protect the interests of the tenant, and to promote the general good of the community.

I am, sir, your obedient servant

March 10. B.

EXCESS OF GAME.

At a meeting of the Vale of Alford Agricultural Association (county of Aberdeen), the Chairman, Mr. Farquharson, of Haughton, having invited discussion on any topic of interest connected with agriculture,

Mr. **Walker**, Bithnie, said he would readily respond to the invitation. He wished to take the present opportunity of adverting to the great loss and damage sustained by farmers from the operation of the game laws, more especially that part of them which is applicable to hares and rabbits. Some might deem it out of place to bring this subject forward, but those not acquainted with the matter would be not a little surprised were they called to witness the extent of the ravages of hares and rabbits on farms that lay close to protected covers or rabbit warrens. At but a recent date rabbits were unknown in this county. He (Mr. Walker) entered on his present farm in 1851, and his predecessor had told him that only two years before—in 1849—he had seen the first rabbit there, and any person would be surprised to see the extent to which this species of vermin had overrun the place now. Formerly the idea of sport was connected with shooting—not that of slaughter, which seems to be the case now. The amount of the products of the soil destroyed by rabbits is very great—not speaking of the turnip crop alone, but of every other crop too. The other year he had his crop of oats and bere valued by practical men, and their estimate was that the bere crop had suffered to the extent of two quarters per acre on the produce; and this year he was sure that on a twenty-acre field of turnips he would have been a great gainer to have given off five acres entirely to hares and rabbits, if the remaining fifteen had been kept clear of them.

Mr. **Morrison** said, Mr. Walker's mistake was in taking a farm, and binding himself to protect the game.

Mr. **Walker**: Not at all.

Mr. **Morrison**: Tenants are commonly bound to do so.

Mr. **Christie**, Auchinto[illegible] said he had no reason to complain of game for his own part. His landlord had never allowed game to increase unduly; he had liberality enough to say to his tenants, "Go and shoot them." And where such is the case the tenants are not likely to let them get too abundant. But he knew for certain that some tenants, now present, had great reason to complain of the operation of the game laws. He had heard lately of some gentlemen being taken to farms in the locality, and after going over a good many fields, and then making their valuation of the proportion destroyed on many fields, they came to one place where they said, "We cannot value here—there are no data." The crop was all destroyed. Now, if the game laws are abused in this way, preserves kept, and tenants' crops destroyed, he saw no reason why every agricultural society should not take the matter up as a grievance, and petition Parliament to have the game laws abolished, or at least modified.

The **Chairman** said he sympathized very much with Mr. Walker, but not having any rabbit warrens, nor any very large amount of game himself, he could not speak to very much practical purpose on the subject.

LONDON, OR CENTRAL FARMERS' CLUB.

A meeting of the Committee was held at the Club-house, New Bridge-street, Blackfriars, on Monday, March 5, L. A. Coussmaker, Esq., in the chair. There were also present Messrs. R. Bond, W. Cheffins, T. Congreve, J. Cressingham, W. Fisher Hobbs, C. W. Johnson, E. Little, J. J. Mechi, T. Owen, B. P. Shearer, S. Skelton, J. B. Spearing, James Thomas, Owen Wallis, and J. A. Williams.

The minutes of the last meeting were read, and the usual monthly statement of accounts received.

The following Members were elected:—

J. Allen, Parsonage Farm, Erith.
W. M. Anderson, Wooley Park, Wantage.
R. Burdon, Castle Eden, Durham.
A. Crosskill, Beverley.
J. Dumbrell, Ditchling, Sussex.
J. Fuller, Dyson's Lodge, Henley-on-Thames.
A. M. Lawson, 27, Great George-street, Westminster.
W. T. Matheson, Barnsbury-street, Islington.
W. Rosser, Llanelly, Carmarthen.
W. Baxter Smith, New Farm, Bromley.
G. H. Verity Sarnfawn, Bridgend, Glamorgan.
R. Ward, Drayton, Rockingham.
R. G. Welford, Goff Oak, Cheshunt.

Some other names were read for the first time.

A letter was read from Mr. H. Trethewy, acknowledging the compliment paid him in his election as a Trustee of the Club.

A letter was read from Mr. S. Sandars, of Hemel Hempstead, suggesting that the Committee should "ask Mr. Mechi to give his balance-sheet, showing his profit of £600 on the past year." Mr. Mechi said, in answer, that he was about to read a paper at the Society of Arts, when he should furnish some details of his profits and practice.

The following Members were appointed as "the House Committee" for the year:—L. A. Coussmaker, C. W. Johnson, J. J. Mechi, B. P. Shearer, James Thomas, H. Trethewy, and Owen Wallis.

The thanks of the Committee were ordered for the following works, regularly presented to the Club:—"The Journal of the Royal Agricultural Society of England" (half-yearly), by the Society; "The Farmer's Magazine" (monthly), by the proprietors; and "the Sporting Magazine" (monthly), by the proprietors; as well as the subjoined London and local papers, by the several proprietors:—"The Mark Lane Express," "The Bankers' Circular," "The Civil Service Gazette," "The Mining Review," "The Estates Gazette," "The Musical Times," "Journal d'Agriculture Pratique," "Aris's Birmingham Gazette," "Banbury Guardian," "Bristol Mercury," "Cambridge Chronicle," "Cambridge Independent," "Essex Herald," "Essex Standard," "Leicester Journal," "Maidstone Journal," "Midland Counties Herald," "Northampton Herald," "Wiltshire Independent," and "Worcester Journal."

A stereoscope, with some agricultural slides, has also been presented to the Club by "the London Stereoscopic Company.

THE CHANGE IN THE MALT DUTIES.

The announcement of the Chancellor of the Exchequer, on Friday, March 16, that the subject of the proposed change in the malt-duties would not be gone into till after Easter, gives those who are specially interested in the matter an opportunity of looking into the details; and as the question is of general importance to our readers, both as producers and consumers, we have gone into some of the statistics bearing upon the production of malt and the consumption of beer, which may be found useful for reference.

In England and Wales, in 1857, there were 6,235 maltsters, paying a licence-duty of from 2s. 7½d. to £4 14s. 6d. per annum; 11 roasters of malt, paying £20 per annum; and 21 dealers in malt, paying £10 per annum. The duty derived from all these was £15,338. In Scotland there were 653 maltsters, 2 roasters, and 1 dealer; and the duty received from these licences was £1,124. In Ireland, 158 maltsters, 9 roasters, and 1 dealer; paying an aggregate licence-duty of £740. There are therefore 7,091 persons who are makers of or dealers in malt. The reduction in numbers of late years is very noticeable. In 1847 there were 9,578 maltsters, distributed as follows: 8,290 in England, 1,098 in Scotland, and 190 in Ireland.

The malt retained for home-consumption, in the last sixteen years, has been as follows:—

	Bushels.		Bushels.
1844	37,187,186	1852	41,072,486
1845	36,545,990	1853	41,992,178
1846	42,097,085	1854	36,812,727
1847	35,307,815	1855	34,401,244
1848	37,545,912	1856	41,579,124
1849	38,935,460	1857	44,545,469
1850	40,744,752	1858	45,105,773
1851	40,337,412	1859	47,746,289

From these figures it will be seen that there has been a gradual and steady increase in the make during the last four years. Since the close of 1855, when malt was permitted to be made free of duty for distillation and for exportation, we find the following quantities were so made free of duty:

1856	4,912,147 bushels,
1857	5,668,948 ,,
1858	5,049,321 ,,
1859	4,987,224 ,,

or an average of five million bushels a-year. The great bulk of this (4,000,000 bushels) is, however, made and used in Scotland.

The estimated quantity of malt used in the beer exported in the past three years has been, in 1857, 1,066,958 bushels; in 1858, 1,105,622 bushels; and in 1859, 1,316,986 bushels.

The revenue derived from malt since 1856, when the duty was reduced from 4s. a bushel to 2s. 7d. and 5 per cent., has been as follows:

1856	£6,676,350
1857	5,690,950

The duty charged in each round, or period of six weeks, is payable within six days after the termination of such round; unless where bond has been given for the payment of the duties, in which case the maltster is entitled to a further credit of eighteen weeks. When sureties are taken, a bond is given by two persons, not being maltsters, for double the value of the duties which shall be likely to become due from the maltsters within a period of eighteen weeks. A recent return shows that, in the seven years ending with 1858, there were fifteen cases in which sureties have been called to pay duties by default of their principals; the aggregate amount of duty being only £5,042 in that period. The loss of malt-duty incurred by the revenue during the same period has been under £900, in fourteen instances.

Calculating the malt charged with duty at 48,000,000 bushels per annum, and the population at 29,000,000, we have a consumption per head of 1.55 bushels (or a little more than 1½), and the revenue yielded, £5,400,000, gives a proportion paid per head of 3s. 8d.

As upwards of 4,000,000 quarters of grain are now employed in making beer (calculating 3½ barrels of beer for each quarter, and 36 gallons for each barrel), we have the enormous quantity of 490,000,000 gallons made, or an average consumption of nigh 19 gallons per head, supposing it were all used at home. But there is an annual shipment of about 534,000 barrels to deduct.

If the great increase in the population be considered, this average quantity will, after all, appear very small for a national beverage. Malt liquor is the natural, and should be now, as it once was, the national liquor of England. It early became to the labouring classes what the inferior *vin ordinaire* is to the people of France—at once a necessity of life and a luxury. The taste for it was universally diffused. Two centuries ago the consumption of duty-paid ale, irrespective of home-brewed and untaxed, was nearly 7,000,000 barrels.

At present we do not believe the quantity privately brewed to bear any very great proportion to that brewed for sale. Private families, unless those resident in the country and having large households, not thinking it worth their while to devote the time and trouble to the manufacture, which can be obtained nearly as cheap and good by purchase, in small or large quantities.

In 1854 the war excise duty on malt was imposed, yielding £2,450,000 to the revenue, and again reduced in 1856. The effects are seen by the variation in the quantity made, as already stated. The malt charged with duty in the last seven years has been:

	Bushels.		Bushels.
1853	42,039,748	1857	40,298,513
1854	36,819,360	1858	41,605,665
1855	33,887,234	1859	41,981,952
1856	37,980,041		

No bere or bigg is used for malting in England, and the quantity so employed in Scotland and Ireland is only about 120,000 bushels, the duty being but 2s. per bushel on this grain. The average price of barley in England and Wales, in 1858, was 34s. 8d., against 42s. 1d. in 1857, 41s. in 1856, 34s. in 1855, 36s. in 1854, 33s. in 1853, 28s. in 1852, 24s. in 1851, and 23s. in 1850. In 1815 the price ruled at 31s. 2d., in 1820 34s. 11d., in 1825 40s. 1d., in 1830 32s. 7d., in 1835 29s. 11d., in 1840 36s. 5d., and in 1845 31s. 8d. Fully two-thirds of our barley crop is used for malt, but our average foreign imports of barley are 1,700,000 quarters yearly. What quantity of this will come in malted under the new regulations remains to be seen.

And now we will close with a few words on continental beer. We learn from the agricultural statistics of France that the quantity of beer made in that country in 1846 was 3,885,365 hectolitres, of the value of 58 million francs; of cider, 10,880,947 hectolitres, value 84,422,137 francs. According to M. Armand Husson's interesting book on the consumption of Paris, it would seem that there are consumed in Paris about 60 million gallons of liquids of all kinds, equal to 55 gallons for each person per annum, or say about a bottle per day. Of this 30 gallons are wine and beer, to 33 gallons consumed in London per annum per head. The character of the beverages in each capital are, however, very different, for while the Parisian spends in the proportion of 62s. per annum for wine, and 11s. 6d. for brandy, he only lays out 3s. 6d. on beer and cider. About 25 gallons of the French consumption is wine alone, and by far the greater quantity of the British is beer. Out of 533,828 barrels of beer and ale shipped in 1858 from Great Britain, only 4,299 barrels went to France—the Dutch and Belgians even take more of our beer. In the Grand Duchy of Baden the malt tax brings the Government annually £25,417. The largest breweries are those of Mannheim and Heidelberg. A great deal of beer is also imported from Wurtemberg and Bavaria; nevertheless the consumption of beer in the Grand Duchy has diminished since the revolutionary years of 1848 and 1849. From 1842 to 1846 the annual amount of beer brewed in the country was calculated at 110½ maas per family. In Russia the imports of ale and porter are but small, although there is rather an increase of late years. In 1858 the imports at St. Petersburg comprised 1,291 hhds. 150,000 bottles of porter, and 37,000 bottles of ale.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

At a Weekly Council, held Wednesday, February 29, Sir E. Kerrison, Bart., M.P., in the chair, the names of candidates for election were read.

A letter from Mr. R. Wainwright, advocating the use of gas lime and salt as a manure for light land, was read, as also the answer of Professor Voelcker, to whom it had been referred, in which he recommended the use of gas lime and salt only on light soils deficient in lime, and where lime and salt are found beneficial.

A communication was received from the Central Society of Agriculture in Belgium, requesting information on Pleuro-pneumonia and the means adopted to combat the disease, having particular regard to the effects of inoculation. A reply was ordered to be made that inoculation was not found in this country to rest on any scientific basis, and as such it has not received the sanction or support of this Society. In this country no statistics of the number of cases of pleuro-pneumonia has been kept, and consequently little is known of the number of those of inoculation.

The Council then adjourned to its Monthly Meeting on the 7th March.

A Monthly Council was held on Wednesday, March 7, Lord Walsingham, President, in the chair. Present: Lord Feversham, Lord Leigh, the Hon. W. G. Cavendish, M.P.; the Hon. Col. Hood, the Hon. Augustus Vernon, Sir W. Williams Wynn, Bart., M.P., Sir Brooke Bridges, Bart., M.P., Sir E. Kerrison, Bart., M.P., Mr. Amos, Mr. Hodgson Barrow, M.P., Mr. Barnet, Mr. T. Raymond Barker, Mr. Barthropp, Mr. Caldwell, Col. Challoner, Mr. B. T. Brandreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, C. Wren Hoskyns, Mr. Hudson, Mr. Humberton, M.P., Mr. Lawes, Mr. Lawrence, Mr. Pope, Mr. Thompson, M.P., Mr. Torr, Mr. Turner, Professor Voelcker, Mr. Wilson, Mr. T. B. Western.

The following new Members were elected:

Balston, Thomas, Chart Sutton, Staplehurst
Bancks, James, Prebendal-house, Thame
Buggins, W., Booth's-farm, New Oscott, Birmingham
Cavendish, Lord Geo. Henry, M.P., 3, Upper Eccleston-street
Cobbett, John M., Skeynes, Eden-bridge
Corner, Edward, Whitby
Drewitt, Henry, Milvill-farm, Titchfield
Dumbrell, James, Ditchling
Fisher, C. J., Huntley's, Tunbridge Wells
Ganday, Lieut.-Col, Heaves, Milnthorpe
Gray, William, Kingston, Drem, East Lothian
Grylls, Capt. Glynn, Waterhouse, Exbridge, Tiverton
Hall, George, Garford, York-hill, Ledbury
Henly, T. N., Calne, Wilts
Hobbs, Charles, Maisey Hampton, Gloucestershire
Hollier, Amos, Lindley-grange, Hinckley
Humphries, Twyning, Tewkesbury
Mayall, John E., 224, Regent-street
Mildmay, Humphrey, M.P., Shoreham, Sevenoaks
Newport, Viscount, M.P.
Pike, James, Reading
Ranken, W. B., Abbot's Langley, Herts
Reynolds, J. B., Lubberthorpe, Leicester
Roughed, James, Auldhame, North Berwick
Sanders, Wm. W., F.R.S., Reigate
Shaw, Wm., Cold Morton, Stowe, Staffordshire
Smith, Robert Thursfield, Whitchurch, Salop
Snewing, Charles, 56, Russell-square
Spencer, Captain, Distington, Whitehaven
Spencer, John, Whoolton-hall, Newcastle-on-Tyne
Taylor, John, Aston Clinton, Tring
Welstead, Frederick, The Cottage, Stonely, Kimbolton
Wightwick, Thomas Norman, Canterbury
Wilkes, Rev. Robert, Loft's-hall, Elmdon, Royston
Williams, David, Kinmel-farm, St. Asaph's

Professor Voelcker was added to the list of Honorary Members.

The usual Monthly Report of the Finance Committee was received, by which it appeared that the current cash balance in the hands of the bankers on Feb. 29 was £3,998 10s. 8d. The Secretary's receipts during the past month had been duly examined by Messrs. Quilter, Ball, and Co., the professional accountants, and also by the Finance Committee. Sundry accounts were ordered to be paid.

The Committee recommended a payment of £25 to Mr. Huxley for the extra duties he has had to perform during the past year.

The late Finance Committee handed in a statement of accounts from July 1 to Aug. 31, 1859, when the present committee came into office.

The report of the Committee appointed to select an Editor of the Society's *Journals* was presented by Mr. Thompson, M.P.; 25 applicants had complied with the conditions announced by advertisement. The whole of these candidates supported their claims by testimonials in proof of their ability and fitness for the office, and more than one have shown to the satisfaction of the Committee that they possessed the highest qualifications required in an Editor of an agricultural journal. The Committee had no hesitation in recommending Mr. Philip Howard Frere as a gentleman in every respect fitted to perform the duties of Editor to the Society. Mr. Frere was therefore duly appointed to the office.

CANTERBURY COMMITTEE.—The Committee recommended that inquiries be made respecting a reduction in the cost of Catalogues for the country meeting. That the Secretary be authorised to communicate with the Railway authorities respecting the transport of live stock and implements to Canterbury. That the following reply from the general manager of the South Eastern Railway respecting the heights of bridges on that line be published for general information: "In reply to your letter of the 8th instant, the inside dimensions of our trucks are as follows: Goods trucks: 15 feet long by 7 feet wide, 14 feet long by 6 feet 2 inches wide; coal trucks, 14 feet long by 6 feet 3 inches wide; cattle trucks, 13 feet 10 inches long by 7 feet 1 inch wide; carriage trucks, 15 feet long by 7 feet wide. The majority of the goods trucks are of the largest size, and all may be laden 7 feet 6 inches above the top of their floors."

IMPLEMENT COMMITTEE.—The Committee recommended that, in answer to inquiries made by different implement makers, a reply should be sent to the effect that it be left to the option of makers of threshing machines whether they put in a shaker or screen, or both, provided they keep within the limit of six-horse power; and also that combined finishing machines do not come within this year's prize sheet.

CHEMICAL COMMITTEE.—It was arranged that Professor Voelcker should investigate the following subjects during the present year:

1. Continuation of field experiments on Barley.
2. " " " Wheat.
3. " " " Turnips.
4. The action of simple saline substances on the soil.
5. The feeding value and composition of Mangel pulp.
6. The chemistry of Cheese and Butter manufacture.

A vote of £200 was granted to Professor Voelcker for his investigations during the past year.

On the motion of Mr. Thompson, seconded by Mr. Torr, the following committee was appointed to consider and report to the Council whether any and what changes should be made in the present mode of reporting the business transacted at the weekly and monthly Council Meetings, both for the use of the Society and for communication to the public journals, viz.: Journal Committee, Col. Challoner, Mr. Fisher Hobbs, and Mr. Brandreth Gibbs.

A deputation from the Local Committee at Canterbury, consisting of the Mayor, Mr. Punnett, and Mr. Collard, Hon. Sec., waited upon the Council to confer on the subject of local prizes. The following were accepted with thanks:

LIST OF LOCAL PRIZES.

PLOUGHS.	First prize	Sec. prize.	Third prize.
For the Plough on the Turnrise principle or otherwise best adapted to turn the furrow-slice, according to the Kentish system of ploughing, the depth of the furrow not to be less than 8 inches	£30	£20	£10
For the ploughman	6	4	2

For the Implement best adapted for the general cultivation of Hop lands	£10
For the Machine best adapted for mowing Grass and Clover for agricultural purposes..............................	20
For the Machine best adapted for reaping agricultural crops	10
For the Machine best adapted for pressing Hops (in cloth) for the home market..	10
For the design of the most economical building the best adapted for drying Hops, to be illustrated either by plans or models, accompanied with an estimate and specification in detail of the cost....	30
For the apparatus the best adapted for drying Hops........	20

HOPS.	First prize	Sec. prize.	Third prize.
For the best sample of Golding Hops.....	£10	£5	..
For the best sample of any other kind of Hop	10	5	..
For the best managed sample of Golding Hops	7	5	£3
For the best managed sample of any other kind of Hop	7	5	3

WOOL.

For the six most valuable Kent fleeces combining quantity and quality of one year's growth	£10
For the six most valuable Long-wool fleeces, Kent or otherwise	10
For the six most valuable Short-wool fleeces	10

[The wool to be the property and growth of the Exhibitor.]

SHEEP. Kentish or Romney Marsh Breeds.	First.	Sec.	Third.
The best pen of 5 two-year-old Ewes......	£10	£ 5	
" " 5 three-year-old Ewes	10	5	
The best Shearling Ram..................	5	5	£ 5
" Ram of any other age	5	5	5
" pen of Shearling Ewes	5	5	5
The Sheep to be from the same flock and bred by the exhibitor, and the Ewes to have brought up a Lamb to the 1st of June.			
CATTLE.—Sussex Stock.			
Class I. Bull calved on or before July 1, 1858, and not exceeding 6 years old	30	15	5
" II. Bull calved since July 1, 1858, and more than 1 year old..........	25	15	5
" III. Bull calf, above 6 and under 12 months old	10	5	..
" IV. Cow in-milk or in-calf, above three years old	20	10	5
" V. Heifer in-milk or in-calf, not exceeding 3 years old	15	10	5
" VI. Yearling heifer	15	10	5
" VII. Heifer calf, above 6 and under 12 months old	10	..	..
PONIES OF ANY BREED.			
The owner of the best Stallion Pony not exceeding 14 hands high	20	10	..
The owner of the best Mare	15	5	..

The undermentioned local societies contribute from their funds towards the above-named local prizes, viz.:—The Kent Cattle and Implement Association, and the Feversham, Deal and Dover, Ashford, Normington and Wingham, Sittingbourne, Chatham, Isle of Thanet, Gravesend, and Rochester Agricultural Associations.

It was resolved that the judges for local prizes be appointed by the Society in the usual way, due respect being paid to the recommendation of the Local Committee. Mr. Humberston's motion relative to a scientific investigation into the manufacture of cheese was referred to the Chemical Committee.

On the motion of Mr. Brandreth Gibbs, seconded by Mr. Torr, the Council entered into the consideration of the districts for the future country Meetings of the Society, and it was resolved that YORKSHIRE be the district selected for the meeting of the Society in 1861, and the Secretary was directed to furnish the schedule of requirements to the authorities of any city or town desirous of inviting the Society. The invitations received will be considered at the Monthly Council on the 4th of April, when a committee will be appointed to inspect the accommodation offered.

On the motion of Mr. T. Raymond Barker, seconded by Colonel Challoner, it was resolved—

"That the Council concur in the re-transfer into the name of Mr. Huxley, in the Three per Cent. Reduced Stock, in the books at the Bank of England, of the sum of £300 transferred by him into the names of the Right Hon. Lord Portman and Thomas Raymond Barker, in September last, as security on his part for such sums as might come into his hands, on account of the Royal Agricultural Society, as Acting Clerk in the Financial Department. That the expense of such transfer be paid by the Society, and that the President be requested to convey to Mr. Huxley the deep sense entertained by the Council of his spontaneous and disinterested proposal when offering such guarantee."

A communication from Mr. Smith, of Woolston, relative to the judges' report on the steam cultivators exhibited at Warwick, was referred to the Implement Committee, who would confer with the Judges and Consulting Engineer.

A complete set of the Hereford Herd Book was presented by Mr. Duckham, and thanks ordered.

The Council then adjourned to its Weekly Meeting on the 14th March.

At a WEEKLY COUNCIL held on the 14th March, Lord Walsingham, President, in the chair, the report of the Consulting Chemist for the year 1859 was presented, and read as follows :—

REPORT BY DR. VOELCKER, AND CHEMICAL INVESTIGATIONS AND ANALYTICAL WORK CARRIED OUT IN 1859.

At the request of the Chemical Committee of the Royal Agricultural Society, I have undertaken the following investigations :

1. Experiments on the changes which liquid manure undergoes in contact with soils of known composition.
2. Experiments and top-dressings for Wheat.
3. ,, ,, Barley.
4. Field Experiments and Swedish Turnips.

The investigations relating to the experiments on the changes which liquid manure undergoes in contact with soil and the experiments on top-dressings upon Wheat are published in the *Journal* for 1859. The experiments upon Turnips have been successful, and present interesting points which render a continuation of similar experiments very desirable. The Barley experiments unfortunately were completely spoiled by the ravages of the wire-worm. I would suggest a repetition of the Barley experiments. Besides these investigations I have published, in the *Journal* for 1859, a paper on Anbury and the Composition of Diseased Turnips, another paper on the Composition of a Mangel Wurzel kept for Two Years, and a third paper on the Chemical Composition of the Chinese Sugar-cane (Sorghum saccharatum). Various visits to different agricultural districts gave me an opportunity of gaining information on practical matters, with which it is desirable a scientific man should be conversant, in order to take up with any hope of success inquiries relating to agricultural improvement. I would notice especially the pleasure and information which I derived from visits to Scotland, Warwickshire, and Norfolk. The analytical work done in my laboratory in 1859 for members of the Society has been quite as brisk as in 1858. Letters of inquiry relating to chemical agricultural matters have been very numerous, and have taken up much of my time. As far as it is in my power I shall endeavour to answer all letters addressed to me by members of the Society with as little delay and as fully as possible. It affords me much pleasure to report that the members of the Society have largely availed themselves of the privilege of obtaining an opinion of the quality of oil-cakes, bone-dust, and Peruvian guano, at the moderate charge of 5s. each per sample. It is satisfactory to report that comparatively few cases of adulterated guanos have been brought under my notice, and that the average quality of superphosphate of lime and turnip manures in general has been greatly improved in 1859. Fraudulently-prepared artificials and very inferior superphosphates are not nearly so common as they were a few years ago. In every market-place excellent artificial manures may now be bought at reasonable prices, and superphosphates may be obtained in almost every locality at lower prices than they can be prepared by the farmer himself, even if no allowance is made for expense of labour and trouble. The improvement in the trade of artificial manures is very marked indeed, and due no doubt in a great measure to the growing habit of agriculturists to have their manures tested in the laboratory. Whilst inferior manures are now the exceptions, I regret to say the adulteration of oilcakes and the employment of bad and foul seed by oil-crushers is a growing evil, which requires to be checked. The number of inferior and downright injurious oilcakes submitted to me for analysis and examination has far exceeded that of really good cakes. Good American linseed-cake is frequently recrushed in this country, and mixed by unprincipled dealers with bran, rapeseed, warehouse sweepings, and various other cheap materials, Linseed cakes, besides being made of inferior foreign linseed, containing the seeds of numerous weeds, are occasionally obtained from a mixture of oily seeds, such as linseed, rape, gold of pleasure, hempseed, &c. All these cakes are greatly inferior to good English or American cake. Several cases of poisoning with adulterated or inferior oilcakes have been brought under my notice by members of the Society. In two or three instances the mischief done by bad oilcake was due most probably to the presence of numerous seeds of weeds, the botanical character of which could not be distinguished. In one instance, I was enabled to detect in an oilcake which had killed an animal the husk of the castor-oil bean. Rape-cake, with the exception of green German rape-cake, very frequently contains mustard, and should be used with great care, and rejected as unfit for food if found to contain too much mustard. I would recommend to the members of the Society particular caution in buying a variety of rape-cake, which is now largely sold under the name of Indian rape-cake, or simply as rape-cake. This cake appears to be made from a species of wild turnip, and not from rapeseed at all, and to contain a variable, and often very large proportion of wild mustard. Several cases of poisoning with Indian rape-cake have been brought under my notice in the course of 1859, and in one instance an action for damages for the loss of four cows, occasioned by eating Indian rape-cake, was sustained successfully at the Wells Assizes. The cake which killed the animals was submitted to me for analysis, and found to contain an unusually large proportion of Mustard, which seed no doubt had done the mischief. Since the trial at Wells I have examined a good many other samples of so-called Indian Rape-cake. Some of the samples I found perfectly wholesome, and almost free from Mustardseed: others contained so much of this pungent and irritating seed, that I could not but advise to reject the cakes for feeding purposes. Cotton-seed cakes have been more frequently used last season than in the preceding one, and a considerable number of Cotton-seed cakes were submitted to me for analysis. The quality of these cakes was found to vary much, and the increased demand for Cotton-cake has lately rendered the best American decorticated Cotton-cake somewhat scarce. On a case of death caused by the use of Cotton-cake made of the whole seeds, I have reported before this. At this time of the year I would recommend likewise caution in buying nitrate of soda and fine bone-dust; for in some samples of nitrate of soda analyzed by me in 1859 I detected as much as 20 to 33 per cent. of common salt. Fine bone-dust has lately been adulterated with Vegetable Ivory, a substance which in a manurial point of view is worth nothing. In addition to these analyses, which present points of general interest to the agriculturist, a great many analyses of more or less practical importance to the individual sender have been performed in my laboratory. Thus many soils, subsoils, marls, limestones, building stones, refuse materials of manufactories, spring, and well waters, &c., have been referred to me for analysis. The question of the application of the sewage of towns for agricultural purposes has also engaged my attention, and led to much analytical work and many letters of inquiry on the part of gentlemen interested in this matter. In conclusion, I beg to propose for the consideration of the Chemical Committee the following subjects for investigation for 1860 :

1. The continuation of Field Experiments on Barley.
2. " " Wheat.
3. ,, " Turnips.
4. The Action of simple Saline Compounds on the Soil.
5. The Feeding Value and Composition of Mangel Pulp.
6. The Chemistry of Cheese and Butter.

AUGUSTUS VOELCKER.

March 7.

Communications were also received from Mr. Fulbrook, Mr. Farmer, and Messrs. Hardy.

OUR WINE TRADE AND PRODUCE OF THE COLONIES.

If the stimulus about to be given to the consumption of wine here could also be made to react on many of the British colonies in causing them to turn their attention more generally to the cultivation of the grape and the manufacture of wine, it would do much good. Not that we anticipate, however, to draw from thence increased supplies for home consumption, although such a contingency is by no means improbable when a few years have passed over, and practice, experience and the extension of the culture of the vine have been more carried out. We have wide ranges of country well suited to the culture of the vine, and where at least the local consumption of wine might be supplied; and even many unpromising countries, as we shall shortly show, can be made available.

The transference of the culture of several important staples from one country to another holds out encouragement to the enterprise and industry of our colonists. Thus indigo, sugar, and coffee cultivation have been transferred from the West to the East; and British India, Ceylon, and Mauritius now surpass all that was ever done in former years by the planters of Central America, Demerara, or the British West Indies. So also with the production of wool, which has made more rapid strides in South Africa and Australia than was ever done in Europe.

While the vine disease has been so destructive of late years in France, Italy, and other wine districts of the continent, and the wine production of Madeira has been almost annihilated, we see successful attention and great progress making in the Cape and Australia. The increasing demand for Cape wines in the English and other markets has been promptly responded to by an increased supply — one among the many proofs daily arising of the immense productive powers of the Cape colony. In 1850, there were exported from the Cape (exclusive of Constantia) 250,256 gallons of wine; in 1856, the shipments had increased to 720,299 gallons. But if we look at the quantity taken for home consumption, we find that it has advanced from 282,043 gallons in 1854, to 781,581 gallons in 1859.

In Australia the cultivation of the vine and wine manufacture is yet carried on to but a limited extent, arising in some degree from the expense of labour and the want of proper information. In New South Wales there are now about 1,200 acres in vineyards, producing 108,174 gallons of wine and 1,414 gallons of brandy. In South Australia there are 1,100 acres, and in Western Australia 200 acres under culture with the vine. But there is no reason why these areas should not be greatly extended, to the advantage alike of the producers and the colonies, for soil and climate are both favourable to wine production. Although the prevailing taste in Australia is for strong drinks, yet it can scarcely be doubted that less ardent beverages will find favour hereafter. Taking the average of the last six years, the shipments of spirits of all kinds to Australia have been 2,700,000 gallons per annum, and about 1,000,000 gallons of wine; so that upwards of 2½ gallons per head of spirits is drunk yearly to one gallon of wine. This is irrespective of the small quantities made in the colonies, and of malt liquors.

The climate and soil of the West Indies also appear singularly adapted for the production of wines fully capable of entering into successful competition with the most distinguished vintages of Europe, from the luscious and almost unknown Tokay of Hungary, to the less saccharine Hock of the Rhine. The volcanic rocks which form the substratum of almost every portion of the Caribbean archipelago, furnish a soil peculiarly favourable to the culture of the vine. The toil of the vineyard is of the lightest description, and not overpowering for the European constitution, even in the sultry heat of the tropics. Hence the introduction of vineyards into the British West Indies would, sooner or later, be followed by an influx of European labour, which, without entering into fatal competition with the Creole peasantry in the heavier cultivation of the cane, might prove the means, in time, of purifying the moral atmosphere of the islands, introducing habits of greater industry and sobriety, and thus elevating the Colonies in the social scale, while it afforded employment and comfort to thousands at home.

Humboldt tells us that in the first years of the conquest of Cuba by the Spaniards, wine was made there of the wild grapes. Hence a reasonable prospect appears of being able to add wine to the other commercial products of the West Indies, notwithstanding the observation of Humboldt, that, "in no part of the northern hemisphere has the vine hitherto been cultivated, with a view of producing wine, south of 27 deg. 48 min., or the latitude of the Isle de Ferro, one of the Canaries, and of 29 deg. 2 min., or the latitude of Abuscher, in Persia" (Pers. Narr. vol. vii. p. 219). This remark, however, must be taken as restricted to the *Vitis vinifera* of Europe and Asia, although wine has been successfully produced from the fruit of this very species in St. Domingo.

As an evidence of the possibility of making wine in countries previously believed to be unsuitable to the culture of the vine, we may instance the case of the United States, where considerable progress is being made over a large extent of territory, and in widely dissimilar climates. Mr. Erskine, our Secretary of Legation at Washington, in a report recently submitted to the Foreign Office, furnishes some interesting details. It is a generally received opinion that in Europe good wine cannot be produced in regions where the mean temperature of the year does not exceed 50 degrees of Fahrenheit; and it is deemed essential that the summer heat should be of some duration, with a mean temperature of not more than 70 or 71 degrees; that the atmosphere should generally be clear and dry, the cold in winter not excessive, and the soil dry. Along the seaboard of the United States most of these supposed requisites are wanting; and so far back as the year 1817, Humboldt predicted that the vine could not be cultivated in America north of the 40th degree of north latitude, the climate of which, it was assumed, would bear a close resemblance to that of the 50th parallel in Europe. But on the settlement of the regions lying to the west of the Alleghany Mountains, it was found that the vine might be there grown with greater prospect of success, in consequence of the climate being less moist than on the coast; and accordingly a palatable red wine was made from the native grape in Indiana and Missouri, towards the end of the last century. About the year 1826, the Catawba, a native American grape, was first brought into notice, having been found growing at Georgetown, near Washington. This vine, which is derived from the wild fox grape, has gradually supplanted all others, and is now adopted almost universally throughout the United States for making wine. It imparts a very peculiar musky flavour to the wine, displeasing, when first tasted, to many palates; but this dislike is easily removed by habit, and the wine is much relished in Ohio and Missouri, where it sells readily at prices which would be deemed exorbitant in the wine countries of Europe.

The Catawba is at present almost the only grape cultivated on a large scale in North America for wine. In time, however, other varieties will doubtless be discovered, better adapted to the widely-differing soils and climates of the northern and southern States. In southern Missouri alone 5,000,000 acres might be selected admirably calculated for vineyards, without encroaching upon the better lands adapted to other crops. This single state has an area available for vine culture more than equalling that of all France. In the Carolinas and Georgia also there are said to be hundreds of thousands of acres of poor and partially-exhausted hill-sides, which are unfit for the growth of either cotton or maize, which might easily and cheaply be converted into vineyards.

Even in California the vine grows in great perfection, yielding abundance of good wine. The banks of the Ohio are now studded with vineyards, between 1,500 and 2,000 acres being planted in the immediate vicinity of Cincinnatti, with every prospect of a vast increase. In at least twenty-two out of the thirty-two States of the Union, vineyards, of more or less promise and extent, have been planted.

The extent of vineyards is thus returned at the present time: In Ohio, 3,000 acres; in Indiana, 1,000; in Missouri and Illinois, 500 each; Georgia, 100; North Carolina, 300; and South Carolina, 200. It is calculated that at least 2,000,000 gallons of wine are now raised in the United States; the average value of which may be taken at 6s. the gallon.

Large quantities of sparkling wine are made both at Cincinnatti and St. Louis, in imitation of Champagne, and fetch, under the name of "Sparkling Catawba," about 1 dol. a bottle. It is made by exactly the same complicated process and with as much care as in France, which will account for the high price. At no distant period, wine will be produced as cheaply and abundantly in the United States as in Europe, although not equal to the best quality of European wines. Whether American wines will ever become an important article of export must depend mainly on the price at which they can be produced, but the home market is already so extensive that many years must, at all events, elapse before wine can be raised in sufficient quantities to turn the current of trade, and convert the United States into the exporters of an article which has hitherto been chiefly derived from abroad.

Besides his home production of wine, brother Jonathan imports about 4,000,000 gallons of foreign wine, 4,000,000 gallons of spirits, and about 1,200,000 gallons of English ale and porter. This is a snug little table for our cousin to sit down to, of a winter evening. How the glasses sparkle on that board, and how comfortable the old gentleman feels as he stretches his legs under the mahogany, groaning with its 9,000,000 gallons of drinks, while his purse is drawn upon to pay the little bills of 4,000,000 dollars for spirits, 3,000,000 dollars for wines, and 1,000,000 dollars for malt liquors, charged against him by his foreign cousins over the water. We begin to fear that he is a pretty hard drinker; for, besides all these wines, spirits, and ales reported on his custom-house books, he distils a fearful quantity of Monoganhela and Bourbon whiskey, manufactures a dreadfully large supply of "French brandy," brews "lager" beer, ale, and porter enough to fill every day any quantity of great tuns of Heidelburg, and, as we have seen, has taken to make his own champagne and wines to a pretty considerable extent. At this rate, he may soon be able to say that his country is a well-liquored as well as a well-watered country.

In Western Canada, where certain species of wild grapes are very abundant, the manufacture of wine recently introduced has been attended with the most signal success. The instances cited are, therefore, convincing proofs that we must not condemn a country because of locality, without giving it a trial; and the capabilities of producing oil and wine—symbols of fertility—are more widely diffused than is generally supposed.

The cultivation of the vine, and the use of the fermented liquor obtained from its fruit, are recorded together, with the first historical notices which we possess of the human race. But it has been that most-favoured portion, the Caucasian, as it is termed, which professes to rear and appreciate this choice gift of nature. Wherever they have spread their conquering and colonising progress over the different climes of the world, there they have taken with them the grape; and when that fruit thrives well, the country has been considered a blessed one for health and wealth.

The consumption of wine has not increased in this country in proportion to the progress of population and wealth; for, on an average, only 14 persons in every 1,000 drink their three dozen of wine annually, or what is equivalent to a glass per diem. That there is room for extended production and consumption in our colonies, in preference to the ardent spirits which now find such general favour, we fully believe. And in the lines of Martin Luther we may say,

"Who loves not woman, wine, and song,
Lives a fool's life his whole life long."

INVOCATION TO SPRING.

Come, O Spring! with skies of azure,
Come, and bring us joy and pleasure!
Come, with birds through bright skies winging;
Come, with waters gaily singing!

Come, fair Spring, enrobed with flowers;
Come, with cool refreshing showers;
Quickly come, for we are weary
Of old Winter, stern and dreary!

Come! with thy soft lights and shadows,
Gliding o'er the bright green meadows;
Come, for young hearts full of lightness
Dream of thy long days of brightness.

Come! the brook would fain be dancing,
'Neath thy dewy eyes, clear glancing;
Hear it sighing for the flowers,
And fresh leaves to deck its bowers.

Come! the forest old rejoices,
Lifting up its myriad voices;
Like an anthem, rising, falling—
"Come, fair Spring, O, come," 'tis calling.

Come! the blackbird's merry trilling
All the sunny air is filling;
But his note seems touched with sadness,
'Till thou com'st with light and gladness.

Come! we're sighing for thee daily,
Come! and deck the old earth gaily;
Chase away our heart's dull sadness,
With thy merry songs of gladness!

—*Country Gentleman.*

AGRICULTURAL LABOURERS WANTED.

Multifarious indeed are the inducements for consulting the advertisement columns of a newspaper. One man wants to hire a house, and another to sell a horse. This is on the look-out for a servant, and that for a master. A. B. is desirous of forming a matrimonial connexion, and C. D. is seeking an agreeable companion. Here a highly-respectable "party" is almost over-anxious to lend his money, and there another, with equally unexceptionable references, is quite as ready to borrow it. A susceptible traveller has lost his heart in a railway journey from London to Brighton, and a serious person his watch and appendages somewhere in the vicinity of Exeter-hall. "Will Annie be on the bridge in Kensington-gardens at twelve on Tuesday?" And two sovereigns and no more will be given on the return of a rough-coated gentleman, with a black eye and a short tail, who answers to the name of "Smut." Such notifications as these jostle side by side with where we shall get the cheapest dinners, and how our funerals may be most economically performed, with the new work that is in the press, and when Mr. Sims Reeve will appear next. But, after all, the most methodical of these several Lines are those which marshal into due order the ministering angels of our much-cherished Penates. The Hebes and Ganymedes, the Phaetons and Mercurys, the Mentors and Minervas of every-day life, gardener, coachman, cook, nurse, up to governess or tutor, are all duly wanting or wanted. There is scarcely anything you need look in vain for, from the anyways-but-plain cook who must have a scullion or two under her, or the punctilious housemaid "where a footman is kept," to the Tilly Slowboy girl of all work, or the very odd man who "is willing to make himself generally useful." We repeat, if a servant wants a place or an employer wants a servant, he now turns to the advertisements as a matter of course. We are getting, however, a point beyond this. There is an innovation creeping into the groom, butler, and coachman business, or that of "servants" as so distinguished. There is other kind of aid required, quite as much or even more of a necessity, and people now look about for a labourer—"a common working man," as he is called—as keenly as they might do in the Backwoods of America, or the New Settlements of Australia.

Let us toss over the *Times'* Supplement, and go to the country for a novelty. It is in every way a suggestive one. In the *Nottinghamshire Guardian* then, is the following advertisement, which we allow Mr. Brett the full benefit of some further circulation:—

TWO AGRICULTURAL LABOURERS WANTED by **Mr. Brett**, Oxton Grange, near Southwell. None need apply but men of industry and good character.

This would seem, at the first glance, almost altogether unprecedented. But it is not so. Within a short period a very similar announcement has appeared in the district journal of the little town of Arundel, in Sussex, only with the more definite considerations of "liberal wages and a cottage provided." There may be many more instances than we have here to offer, but even these speak significantly enough to the change that is coming. The labouring man is no longer a drug. It is no longer a matter of policy to "bolt" him from his home, like the rats, or rabbits, or any other vermin. The ingenuity of man is no further taxed to keep him without a settlement, and to pass him like a bad shilling from hand to hand, with nobody willing to own him. The question is not now what we shall do *with* our labourers, but what we shall do *without them,* and what we *can* do for them? So openly admits Mr. Brett, and so will many more have to confess with him. Of course, it is easy enough to understand that almost at any time and under any circumstances there will be touchy, tyrannical, over-exacting employers, who will be continually short of hands—masters, that the men would rather go to "the House," the woods, or the recruiting serjeant, than stay with on any terms. But we have taken the trouble to ascertain something as to Mr. Brett, and we are glad to say that he himself enjoys that same "good character" he stipulates for. As our informant advises us, "he is just the man I should like to let a farm to." Most probably the gentleman at Arundel would turn out to be equally eligible; and their need, either in Notts or Sussex, will soon be, if it is not already, the common one.

And what are we to do? Mr. Harry Bunbury, the celebrated caricaturist of more than half a century since, sent out two very successful etchings. The one, "How to make the most of a horse;" and the companion plate, "How to make the least of him." In the former, the master had his nag well fed, well cleaned, and well pulled together. He pats him on the neck as they go cheerfully over the good road, and, to use a very applicable phrase, they are evidently on the best terms with each other. In the reverse scene, the half-fed ill-conditioned animal is left altogether to himself—with his head loose, and no assistance whatever from his rider. He stumbles along, manifestly little caring whether they come to grief or not. Surely the simile is self-evident. If we want to go the pace—if we wish to keep pace with the times, we must make the most of our men—see them well fed, well housed, and really cared for. We must virtually abolish of ourselves—if Parliament will not do it for us—that odious Law of Settlement. For what is this in its absolute action and intent, but a means to hold the industrious labouring man but as a mere machine, with which we have no sympathies and no congenial interest. We take even his heart's blood and strength out of him at arm's length; and give him to distinctly understand that he has no claim here. It is in obedience to such a self-immolating influence as this that we have gradually come to deserted villages and isolated homesteads. It is by such artful strategy that we wear a man out ere he reaches his occupation, and then send him back for rest and health and comfort to the overcrowded purlieus of some neighbouring city, where rents are high and morals low.

It is here that we must begin to make the most of a man. We may have friendly societies, and premiums for good conduct and excellence in workmanship. We may discuss his condition at our meetings, and propose his health at our dinners. We may welcome him amongst us at certain times and seasons, at harvest-homes and ploughing matches. But we must do more than this. We must have him amongst us. We must draw him away from the enervation and pollution of the worst room in the worst house in the neighbouring town. We must make him heart and body one of us again. His condition as an absolutely necessity must be improved. The scarcer labour becomes, the more call will there be for skilled labour. The seven or eight shillings a-week man, who just existed, and did just as he always had done, will go out of use. His place will be filled by one with more energy, more education, and higher aspirations. He will have to do the work of two or three of the old-fashioned class, and with the many aids now brought to his hand he will do it. But it will be a fair bargain. His lot will no longer be regarded more or less as a matter of charity, Or, "if I dismiss you, where will you go then? To the parish for a loaf, or to the beer-shop for a wire?" By no manner of means, but to the *Nottingham Guardian* office, and see how many places for men of industry and good character they have on their books.

The interests of landlord, tenant, and labourer are identical. We were never coming to feel this more than we are just at present. Some mutual concession must be made, and some better understanding must be arrived at. The labourer, more than all, insists on a better position, simply because he can command it. There are other pursuits and other countries ready to receive him with open arms, and to make the most of him. What have we to bid against these? An occasional job when we want him, and nothing more—or a comfortable home, good pay, and the feeling that his presence amongst us is courted, and not scouted. We must combine the two extraordinary but significant advertisements we have referred to. For "Men of industry and character liberal wages and good cottages will be provided."

THE VINEYARDS OF LA BELLE FRANCE.

Punch, in one of those clever cartoons that enliven his pages, lately represented General Beer in full retreat before the light division of French Wines. Should the Budget be recognised, it appears probable that the thick porters, bitter beers, and mild and strong ales may experience a check; and although it is not probable that the popular taste will revert at once from these national beverages to the wines of France, it is possible that they may in time come to be as highly esteemed as they were in England before an excessive duty obliged us to find a cheaper substitute. Down to the Revolution, French wines were very largely imported by us. In 1687 it is shown that we consumed no less than 3,800,000 gallons of it. In consequence of a heavy prohibitive duty it fell in 1786 to 100,000 gallons; and so much had we been weaned from the taste of it, that, when that duty was decreased in 1830, the demand for it stood where it did for some years, and such wines were not used except by those classes or that class to whom the price had not prevented the supply.

The Bordeaux, Burgundy, and Malvoisie wines sparkled in the cups of our ancestors, as we read in many a history, and see confirmed in the gouty twitch observable in the face of many of our fine old progenitors. The Royalist and the Puritan both imbibed its blushing stream, and both were forcible in character, hating strongly, and hitting hard. How far the vigorous constitution of the men of those times was dependent upon the liberal use of these pure unadulterated wines, it is difficult to say; but certainly we have considerable hope in welcoming them back, that they may check the murderous adulterations now going on, to the ruin of the mind and body of her Majesty's subjects, and do somewhat towards diverting the national taste from the highly-brandied ports and sherries, and the liquid fire in which the poor seek for forgetfulness under the pressure of misery and heavy taxation.

There may be some truth in the remark that our climate necessitates a fuller or more bodied beverage than is obtainable from France, and that light thin wines are liable to be rejected with disdain by those who regard the unctuous stream of black porter with steady devotion, regarding it as both "victuals and drink;" but certainly during the summer season we do stand in need of beverages less heady and heating than bitter beer, and wines less stimulating than port and sherry.

In connection with the remission of the duty on malt and hops, this reduction will work very beneficially. Should the Government be able to carry out their intentions, they will go further to abolish intemperance than all the teetotal advocates in the country, all honour to them! The more such aliment can be introduced into our homes, the less will be the inducement to seek them elsewhere; and when they come to be regarded amongst the necessaries of life, like tea or coffee, they will cease to be abused as they are at present.

It has long seemed very strange to me that we should decline to receive the benefits which the sun confers upon the South of France, and content ourselves with all sorts of vile concoctions of home manufacture. Our climate is not suited to the growth of the vine, but that of France is. We grow many things that France cannot; why, then, have we been so long in finding out that it is best to profit by what is best matured by the climate of France, and allow her to benefit by what is best matured by our climate? And seeing that *value* only consists in the *labour* of production, and that barter is only the exchange of one value for another, we are not, in free exchange, charged for the work of the genial climate which ripens the grape or the orange, but enjoy that privilege just as freely as the natives of France and Spain, paying only the carriage of its products, which is perfectly fair. It seems a prodigious folly to deprive ourselves voluntarily of such advantages, and for one nation to build up artificial barriers against another, instead of partaking, as God intended them, in the particular benefits he has bestowed upon each. We are just coming to find out that we gain by exchange rather than by isolation—that scarcity is not to be mistaken for abundance—that we are rather to regard the interests of the consumer than the producer, who has peculiar and providential instincts to guide him. Our taxes and expenditure may be heavy; but we are in a better position to meet them, if we receive gratefully the gratuitous gifts of genial climates, and busy ourselves in work that will enable us to pay back the labour expended in their production. To establish prohibitive duties is to increase our national taxation; for where would be the use of large standing armies and powerful navies, if trade were free?

And France, in this matter of wine, presents a melancholy illustration of the effects of that illiberal policy which pretends to improve commerce by prohibiting the free intercourse of commercial countries; for by excluding the produce of other nations, she virtually deprives, by the same laws, the reception of her own produce into foreign countries. England must pay for the wines of France with her own produce; which if France refuse to receive, she has no equivalent of her own to offer, and must procure one from another country, which operation will restrict the trade and raise the price of French wine. Thus, whilst France "exported to England from 16,000 to 20,000 tuns of wine when the population was only five millions, the supply had fallen off, partly owing to the prohibitory duties imposed in Great Britain, and partly owing to the prohibitory duties imposed in France on British produce, to 1,800 tuns, whilst the population of the country had in the mean time greatly increased."

Much as we may felicitate ourselves upon all this advance, and talk boastingly about an enlightened opinion, I am not so very sure that we do not owe this commercial reform, like *many* others that have preceded it, to the necessities of the Treasury. Be that as it may, we are informed, as I before stated, that the division of Light Wines is advancing, and that "General Beer" is in full retreat. It becomes us to look a little into the quality of this opposing power, and judge how far they are likely to obtain any advantage at Burton, or Romford, or London. The French wines will certainly succeed in routing the British; and patriot as I am, I shall be all too glad to witness the defeat, together with those vile colonial wines that aggravate our bile. From the celebrated Côte d'Or the ruby stream is ready to flow down; from Cette and Frontignac, and Champagne, from the Hermitage and the Madoc, sparkling and effervescing, dry and light, rich and pure, they are flowing towards us, not to inundate, but to irrigate and beautify the fields of pleasure. Should it please my readers, we will in company take a trip to the South of France, to inspect the vineyards, and thus obtain one phase of the agriculture of the country, while we gratify our curiosity concerning the wines offered for our consumption. I purpose, therefore, to devote a column now and then to the consideration of the vineyards of the South of France.

F. R. S.

THE UTILIZATION OF TOWN SEWAGE.

The literature of metropolitan drainage grows and accumulates too rapidly for the proper digestion of it in the time allowed by the pressure, itself, of the question of the public health. There seems to be no end to the complications and entanglements of this question. The Board of Works issues reports upon reports, and subjects the conclusions contained in those reports to the reports of regularly appointed referees, who do but little towards enlightening the public mind, or showing how the maladies contracted by the inhabitants of towns, by the flowing of sewage matter into the rivers can be stayed, or how the sewage diverted to the lands can be utilized. Nor indeed has the public mind been at all likely to acquire confidence in the reports of certain celebrated chemists, who are quite opposed as to the detriment incurred by the population living in the neighbourhood of open drains, or partaking of water polluted by sewage, &c.

Mr. Haywood and some others, in evidence given before a Parliamentary Committee, have stated that "great exaggeration, if not total misapprehension, has existed on the subject of the pernicious influence of the chance emanations from gullies;" and that where smell cannot be detected no injury is likely to result. Dr. Letheby, on the other hand, wishes "to dispel the ignorance which can permit so false a faith as that there is no danger from putridity and filth, when they are no longer offensive to the sense of smell;" and proves that the de-oxygenation of the air by the process of deodorization, or the de-oxygenation of the water—as the case may be—renders the air or the water so much the less fit to sustain life. At every outbreak of epidemic disease, the badly-drained districts, where there are neglected cesspools, stagnant sewers, and untrapped gullies, are always localities where the disease is most active. It need not be that to produce disease these miasms should be so concentrated as to be unendurable. In many of the cases quoted the gases were in a highly diluted form, and yet their effects were unmistakable. It is, therefore, a fallacy of a most dangerous kind to say that sewer gases are not hurtful when they are no longer offensive to the sense of smell, for there is no necessary connexion between bad odours and zymotic poisons. The philosophy of stink teaches us that the pestiferous matter which floats over the coast of Africa, the Sunderbund of India, the plains of Algeria, the marshes of Europe, and the fens of England, is not offensive to the nose, though it is deadly enough to the body; and conversely, there are many horrible stinks which are incapable of producing disease.

And now, after commission upon commission, engineers' reports, reports of gentlemen of the Sanitary Board, and opinions from eminent chemists of antagonistic schools, and the investigation the entire subject has undergone in the Circumlocution Office, where are we?

Why we find out that it is not so much a question for the farmers as for the towns-people. Turn, for instance, to London, where the sewer rates on a moderate house are equivalent to the rent of a respectable tenement in a country town, and yet the stench from the Thames, and the mortality that annually is referable to nothing but the imbibition of its hydro-sulphuretted waters, seem not to be abated, but rather increased. What the rates will be when the present sea-reach outfall is thoroughly adopted and got into working order, might be a question to fill up the spare time of the betting world, but we are assured that they will be something enormous. Some writer has intimated that the fall of Rome was less owing to the barbarian flood from the north-east, than to the *Cloaca Maxima*, and that cesspools would have contributed more to her redemption than courage: he says, too, that Dr. Layard has not informed us whether the Ninevites adopted the aqueous system of sewerage, but that, if they did, of course their career is at once accounted for.

No doubt the worthy Alderman Mechi, who has during late years brought this question of the utilization of town sewage before the country, has beheld this ruin to London with as much trepidation as he has beheld through the Baron Liebig's prophetic glasses the gradual deterioration of the soil of the country. I am sure he merits the thanks of the corporation and citizens of London for the pertinacious manner in which he is continually crying, What is the good of your being at this ruinous expense to expel the ejecta from the sewers to the sea? Some towns are getting a profitable return for it: why cannot you? The Chinese make their privies pay the expenses of hospitality: why do you not seek to make your water-closets defray your sewer-rates?

I say, again, that the citizens of London must solve this question for themselves. If they can decide upon any way by which they can offer to their country friends a copious supply of sewage in its liquid state for the irrigation of their grass lands, their country friends will see what can be done towards fitting their meadows for its favourable reception.

I will not undertake to say that the return will be equal to 10 per cent. upon the cost of the entire work, but I do undertake to say that it will be equal to a good 4 per cent.; and, provided the metropolitanites obtain such a return towards helping them to bear the ruinous expense they are now called upon to incur, with but a small chance of effecting the sanitary improvement expected, men with business heads upon their shoulders will regard that in the light of a very decided advantage. There has been a great disposition in certain quarters to burke this question of the application of town sewage to the irrigation of the land; and those who have written and spoken in its favour have been charged with having an eye to the £2,000,000 which the Government is advised to expend in such works. For this purpose all the cases of amateur gentlemen who have been led to the adoption of the "squirt system," as Mr. Hudson calls it, and failed, are adduced as evidence that there is no value in sewage. But the question is not one of a personal character; and a negative reply to the query, Has such and such a gentleman succeeded in carrying out an independent system of liquid-manuring? will not settle it. Mr. Mechi himself may, or he may not, have succeeded. Other gentlemen in different parts of the country may, or may not, have succeeded—nay, they may have lost thousands of pounds in their experiments. I can credit it, perceiving here and there circumstances which contributed to the unfortunate result; and while acknowledging this to be the true state of the case, I can with the most unshaken confidence hold firm my conviction that sewage is invaluable for grass-lands. The evidence with regard to that part of the subject remains unimpeached by fact, and we have all come to agree with the conclusions put forth by Mr. Lawes in 1855, as the result of careful experiments.

Mr. Sidney is one of those who would induce us to believe that three millions of tons of solid manure, dissolved in water and ready for use, should be cast away as wanting in the elements of fertility. This gentleman, who lives on the repute gained two years back by a creditable compilation of facts on agricultural progress for the *Quarterly Review*, tried hard to bring the meeting assembled on Wednesday at the rooms of the Society of Arts, to hear Mr. Mechi's paper on the sewage question, to this absurd conclusion. After adducing a variety of somewhat contradictory evidence, which showed that certain applications of sewage under certain circumstances had not proved favourable, he stigmatized—as only those can who lack faith in their own cause—all those who held different views, and ventured to express them as either humbugs, or humbugged. Well, this is a free and independent country, in which those who have a taste for it can abuse their neighbours with the utmost liberty; but the practice in time singles out such members of society as objects of indifference.

I am aware that the farming fraternity hold views upon this question very different to those they did hold some years ago; and I am aware that the experiments of celebrated chemists have led them to place a different value upon sewage than they were disposed to place upon it—to give up all idea of deodorizing it, except by passing it through the pores of the soil, where its fertilizing properties will be very properly arrested. Great has been the change on all sides, by virtue of the additional light let in by science upon the facts adduced by practice; but all this light has not served to assure us of the valueless character of the excreta from two-and-a-half millions of human beings, &c., but has surprised us in the very act of preparing to void this fertilizing substance to the sea, to be returned by the tide, and left to breed miasma, exposed upon mud-banks of the river to the sun, at the very time that we are expending £3,133,243 annually in the purchase of the excreta of birds from some islands in the Pacific or the coast of Africa.

F. R. S.

SALE OF SHORTHORNS, AT STOCKWOOD PARK, LUTON, BEDS,

THE PROPERTY OF JOHN S. CRAWLEY, ESQ.,

By Mr. Strafford, of London,

ON THURSDAY, MARCH 1st.

A fine day, a goodly company, spirited biddings, and well-bred stock, all conduced to the full success of this sale. As will be seen, some of the first shorthorn breeders were present, and the stock was very widely distributed. Amongst the company were Lord Braybrook, Lord Chesham, Lord Ducie, Hon. William Cavendish, M.P.; E. Holland, Esq., M.P.; Sir William Miles; W. MacIntosh, Esq.; Colonel Ames; Richard Oakley, Esq.; W. Hubbard, Esq., Hurstpierrepont, Sussex; W. Long, Esq., East Sutton, near Staplehurst, Kent; M. Parkinson, Esq., Leyfields, Newark, Notts; H. Mitchell, Esq., Alloa, Scotland; Mr. Cotton, Saffron Waldon, Essex; Mr. Beasley, Chapel Brompton, Northamptonshire; Mr. E. W. Tracey, Eaton Bridge, Kent; Mr. Upton, Witham, Essex; Mr. Carr, Stockhouse, Settle, Yorkshire; Mr. Aylmer, Dereham, Norfolk; Mr. Wise, Ravensden, Beds; Mr. Topham, Welford, Northamptonshire; Mr. Claydon, Littlebury, Saffron Waldon; Mr. B. B. Colvin, Mr. Samuel Jonas; Mr. Sheldon, Brailes House, Shipton-on-Stour; Mr. Surtees, Dane End, Ware, Herts; Mr. Christy, Pointon Hall, Chelmsford, Essex; Mr. Hales, Hadlow, Kent; Messrs. Crawleys, Luton, Beds; Mr. J. Robinson, Clifton Pastures; Mr. Charles Howard, Biddenham; Mr. W. Ladds; Mr. Atkins, Milcote; J. H. Downes; Mr. Hopper, Beaumont Grange, Lancashire; Mr. MacIntosh, Avery Park, Romford, Essex; Mr. Overman, Redbourne, Herts, &c., &c.

COWS AND HEIFERS.

THE FIGURES REFER TO "COATES'S HERD BOOK."

Baroness, calved January 28, 1847; by Baron Warlaby (7813), dam (Clematis) by Clementi (3399).—Sold to Mr. Carr, Stackhouse, Settle, Yorkshire, £52 10s.

Gem, roan, calved in July, 1850; by Sweet William (7571), dam (Juniper) by Mahomed (6170).—Mr. Aylmer, Dereham, Norfolk, £33 12s.

Tragedy, roan, calved May 3, 1851; by John of Weathamstead (7113), dam (Tiresome) by Walter Buchan (7692). — Mr. Symonds, £42.

Jane, red and white, calved July 26, 1851; by Third Duke of Oxford (9047), dam (Janetta) by Lycurgus (7180).—Mr. Lowder, £43 1s.

Laura, roan, calved September 28, 1851; by Chilton (10054), dam (Lady Juno) by Augustus (8848).—Sir William Miles, Leigh Court, Bristol, £31 10s.

Trinket, roan, calved May 10, 1852; by John of Weathamstead (7113), dam (Tiresome) by Walter Buchan (7692).—Mr. Upton, Witham, Essex, £39 18s.

Flirt, roan, calved August 21, 1852; by Kirklevington (11639), dam (Flounce) by Broughton Hero (6811).—Mr. Claydon, Littlebury, Saffron Waldon, Essex, £38 17s.

Hebe, roan, calved August 24, 1853; by Kirklevington (11639), dam (Young Heroine) by Brennus (8902).—Mr. Brown, £47 5s.

Sprightly, roan, calved in February, 1854; by Monk (11824), dam (Splendour) by His Highness (11580).—Sir William Miles, £52 10s.

Emily, roan, calved November 16, 1854; by Kirklevington (11639), dam (Early Bird) by Standish (7550).—Mr. Wise, Ravensden, Beds, £43 1s.

Echo, roan, calved February 17, 1855; by Nobleman (13390), dam (Evergreen) by John Ford (9253).—Mr. Topham, Welford, Northamptonshire, £52 10s.

Locket, red and white, calved February 21, 1855; by Nobleman (13390), dam (Lizzy) by John of Weathamstead (7113).—Lord Braybrook, Audley End, £73 10s.

Stella, roan, calved March 2, 1855; by Neptune (11847), dam (Matilda) by Broughton Hero (6811).—Mr. Sheldon, Brailes House, Shipton-on-Stour, £73 10s.

Cowslip, red and white, calved April 29, 1855; by Nobleman (13390), dam (Cactus) by Captain Shaftoe (6833).—Mr. Cole, £27 6s.

Sunshine, red and white, calved June 16, 1855; by Kirklevington (11639), dam (Spinster) by Royalty (10756).—Mr. Hubbard, Hurstpierrepont, Sussex, £31 10s.

Lady Carlotta, roan, calved November 30, 1855; by Grand Turk (12969), dam (Lady Lotty) by Udolpho (13907).—Mr. Surtees, Dane End, Ware, Herts, £75 12s.

Myrtle, roan, calved March 20, 1856; by Kirklevington (11639), dam (Madeline) by The Squire (8697).—Mr. Christy, Pointon Hall, Chelmsford, Essex, £65 2s.

Imogene, roan, calved April 25, 1856; by Neptune (11847), dam (Heroine 2nd) by Albert (8816).—Mr. Hales, Hadlow, Kent, £34.

Sweetlips, roan, calved August 29, 1856; by British Prince (14197), dam (Sprightly) by Monk (11824).—Sir Wm. Miles, £79 6s.

Gertrude, roan, calved October 29, 1856; by British Prince (14197), dam (Gem) by Sweet William (7571).—Mr. Hubbard, Sussex, £73 10s.

Orange Blossom, red, calved December 6, 1856; by Tambour (15366), dam (Olive Branch) by Concord (11302).—Mr. Oliver, £34.

Barmaid, roan, calved December 13, 1856; by British Prince (14197), dam (Baroness) by Baron Warlaby (7813).—Mr. Carr, Settle, Yorkshire, £105,

Lilac, roan, calved March 20, 1857; by British Prince (14197) dam (Lizzy) by John of Weathamstead (7113).—Mr. Chandler, £39 18s.

Jewess, roan, calved April 20, 1857; by British Prince (14197), dam (Jane) by Third Duke of Oxford (9047).—Mr. Beasley, Chapel Brompton, Northamptonshire, £45 1s.

Lily, white, calved May 21, 1857; by Highthorn (13028), dam (Tragedy) by John of Weathamstead (7113).—Mr. Chandler, £43 1s.

Snowdrop, white, calved May 21, 1857; by Highthorn (13028), dam (Tragedy) by John of Weathamstead (7113).—Mr. Roberts, Welwyn, £33 12s.

Heneymoon, roan, calved July 11, 1857; by Highthorn (13028), dam (Hebe) by Kirklevington (11639).—Mr. Levy, £96 12s.

Florence, red, calved August 12, 1857; by Highthorn (13028), dam (Flirt) by Kirklevington (11639).—Mr. Hopper, Beaumont Grange, Lancashire, £37 16s.

Emma, roan, calved November 19, 1857; by Bluebeard (14170), dam (Early Bird) by Standish (7550).—Mr. Hubbard, £37 16s.

Tinsel, white, calved November 22, 1857; by Bluebeard (14170), dam (Trinket) by John of Weathamstead (7113).—Sir William Miles, £34 13s.

Grisetta, white, calved December 11, 1857; by War Eagle (15483), dam (Gem) by Sweet William (7571).— — Mackintosh, Esq., Avery Park, Romford, Essex, £52 10s.

Emerald, roan, calved December 16, 1857; by War Eagle (15483), dam (Emily) by Kirklevington (11639).—E. Holland, Esq., Dumbleton Hall, Eversham, £42.

Silkworm, red, calved December 17, 1857; by War Eagle (15483), dam (Sunshine) by Kirklevington (11639). — Mr. Beasley, Brampton, Northamptonshire, £38 17s.

Ayah, roan, calved June 29, 1858; by Marmaduke (14897), dam (Asia) by Second Grand Duke (12961).—Wm. Long, Esq., East Sutton, near Staplehurst, Kent, £85 1s.

Miss Lucy, roan, calved September 26, 1858; by War Eagle (15483), dam (Laura) by Chilton (10054).—E. M. Tracey, Esq., Eaton Bridge, Kent, £45 3s.

Misletoe, red roan, calved January 3, 1859; by Welcome Guest (15497), dam (Miss Myrtle) by Grand Turk (12969).—Mr. Mitchell, £77 14s.

Larkspur, roan, calved February 8, 1859; by Welcome Guest (15497), dam (Locket) by Nobleman (13390).—Mr. Chandler, £53 11s.

White Rose, white, calved February 10, 1859; by Welcome Guest (15497), dam (Red Rose) by Rufus (10761).—Mr. Hubbard, Hurstpierrepont, Sussex, £31 10s.

Julia, red, calved February 20, 1859; by Don Juan (14408), dam (Sunset) by Twilight (9758).—Sir William Miles, £28 7s.

Tragic, white, calved May 28, 1859; by Jasper (11609), dam (Tragedy) by John of Weathamstead (7113).—Sir Wm. Miles, £32 11s.

Ladybird, roan, calved September 16, 1859; by First Fruits (16048), dam (Laura) by Chilton (10054).—Mr. Aylmer, Stoke Ferry, West Dereham, Norfolk, £37 16s.

Filagree, roan, calved October 9, 1859; by First Fruits (16048), dam (Flirt) by Kirklevington (11639).—Mr. Aylmer, £50 8s.

Esther, white, calved October 31, 1859; by Prince Oscar (16757), dam (Echo) by Nobleman (13390).—Mr. Wise, Ravensden, Beds, £16 16s.

Snow-white, white, calved November 12, 1859; by Prince Oscar (16757), dam (Snowdrop) by Highthorn (13028).—Mr. Wise, £19 19s.

Tawdry, white, calved December 11, 1859; by First Fruits (16048), dam (Tinsel) by Bluebeard (14170).—Mr. Beasley, £21,

Sweetheart, rich roan, calved January 17, 1860; by First Fruits (16048), dam (Sweetlips) by British Prince (14197).—Mr. Mitchell, £48 6s.

Edith, red and white, calved January 21, 1860; by First Fruits (16048), dam (Emma) by Bluebeard (14170).—W. Cavendish, Esq., M.P., Chesham, Bucks, £15 15s.

Guava, roan, calved February 24, 1860; by War Eagle (15483), dam (Gem) by Sweet William (7571); together with

Glauca, white, calved February 24, 1860; by War Eagle (15483), dam (Gem) by Sweet William (7571).—Mr. Aylmer, £16 16s.

BULLS.

Ortolan, roan, calved May 15, 1859; by Welcome Guest (15497), dam (Orange Blossom) by Tambour (15366).—Mr. Cotton, Saffron Waldon, Essex, £76 13s.

Juniper, roan, calved July 4, 1859; by Jasper (11609), dam (Stella) by Neptune (11847).—Mr. Upton, Witham, Essex, £27 6s.

Envoy, roan, calved July 5, 1859; by Jasper (11609), dam (Emily) by Kirklevington (11639).—Mr. Lindsell, £22 1s.

Florist, red, calved October 14, 1859; by Prince Oscar (16757), dam (Florence) by Highthorn (13028).—Mr. Parkinson, Leyfield, Newark, Notts, £31 10s.

Hotspur, roan, calved October 17, 1859; by Prince Oscar (16757), dam (Honeymoon) by Highthorn (13028).—Mr. Parkinson, £65 2s.

Herald, roan, calved December 27, 1859; by Prince Oscar (16757), dam (Hebe) by Kirklevington (11639).—Mr. G. Barnes, £21.

Trumpeter, white, calved January 7, 1860; by War Eagle (15483), dam (Trinket) by John of Weathamstead (7113).—Mr. Upton, Witham, Essex, £15 15s.

Sunbeam, roan, calved January 11, 1860; got by War Eagle (15483), dam (Sunshine) by Kirklevington (11639).—Mr. Inskip, £12 12s.

Saucebox, roan, calved February 9, 1860; by First Fruits (16048), dam (Sprightly) by Monk (11824).—Lord Ducie, £31 10s,

Emperor, roan, calved February 29, 1860; by First Fruits (16048), dam (Emerald) by War Eagle (15483).—Mr. Fowler, £6 6s.

Gross amount of the sale, £2,681 4s.

Fifty-eight lots, realizing on an average per lot, £46 4s. 6d.

SALE OF SHORTHORNS AT KIVETON PARK.

On Thursday, March 15, Mr. Strafford, of London, offered for sale by auction the whole of the valuable herd of short horns, the property of the late John Hall, Esq., of Kiveton Park. Although there cannot be claimed for this stock that distinguished fame possessed by many herds, yet, as one generally useful in its character and with a good local celebrity, it still had sufficient interest to bring together a numerous and highly-respectable company. The late Mr. Hall had long been attached to the breeding of the pure short-horn, and the experience of thirty years had evidently not been spent without advantage in the perfection to which he had brought his cattle. The cows had been chiefly purchased of Mr. Claridge, of Jervaux Abbey; Mr. Robinson, of Marsh House; and Mr. Waldy, of Barmpton. They had since been crossed with first-class bulls of Messrs. Bates, Booth, and Torr—three names which stand pre-eminent for this class of animals all over the world. We believe Mr. Hall's sales had principally been for the American market, and with our brethren across the Atlantic he had dealt considerably to his own advantage. The able manner in which Mr. Strafford discharged his duties was a source of general satisfaction and praise; indeed, it may be questioned wether he has his superior as a judge of shorthorn stock. The biddings were by no means so brisk as might have been anticipated, which may principally be accounted for from the want of liberal feeding in the early stages of maturity. The total amount of the sale, including four entires dropped since the issue of the catalogue, was £1,282 11s. 6d. —viz., £1,014 16s. 6d. for the cows and heifers, and £267 15s. for the bulls. The highest-priced cow was bought by Mr. Wood, agent to G. S. Foljambe, Esq., and was considered well worth the money. Amongst the other purchasers were R. H. Wrightson, Esq., Warmsworth; E. Hodgkinson, Esq., Morton Grange; — Ironmonger, Esq., Neasham, near Atherstone; J. W. Machin, Esq., Gateford Hall; T. H. Pedley, Esq., Stubbing Court; T. H. Dixon, Esq., Page Hall; H. Bentley, Esq., Leeds; J. Tomasson, Esq., Barnby Moor; J. Boomer, Esq., Edlington: H. Sorby, Esq, Sheffield; J. Burgess, Esq, Edenham; E. Hodgkinson, Esq., Styrrup; P. Cadman, Esq., Sheffield; — Armstrong, Esq., Pulterton; T. H. Simpson, Esq., Conisbro'; J. W. Spurr, Esq., Wigthorpe; &c., &c.

COWS AND HEIFERS.	gs.
Susan, red and white, calved March 9, 1849; by General Washington (6036)	14
Vincless, roan, calved February 12, 1850; by Roan Duke (8486)	18
Grace Darling, roan, calved in 1850; by Wentworth (11033)	22
Frantic, roan, calved in 1850; by Hornby 2nd (9223)	25
Eliza, roan, calved December 22, 1850; by Roan Duke (8486)	20
Fancy, white, calved December 6, 1852; by Roan Duke (8486)	18
Crocus, light roan, calved June 20, 1852; by Roan Duke (8486)	15½
Maria, roan, calved April 11, 1853; by Roan Duke (8486)	22
Miss Howard, red and white, calved June 29, 1853; by Lord Howard (11727)	32
Fanatic, white, calved Nov. 21, 1853; by Will Watch (12307)	16
Virtue, white, calved Sept. 28, 1854; by Will Watch (12307)	19
Faithful, roan, calved Dec. 8, 1854; by Will Watch (12307)	20
Cowslip, white, calved Dec. 28, 1854; by Will Watch (12307)	27
Sarah, red and white, calved in 1855; by Hamlet (8126)	35
Virgin, light roan, calved August 27, 1855; by Hamlet (8126)	27
Veracity, red and white, calved in Sept., 1855; by Hamlet (8126)	20
Frenzy, light roan, calved Oct. 12, 1855; by Hamlet (8126)	25
Crochet, red and white, calved Dec. 21, 1855; by Hamlet (8126)	20
Fidget, white, calved January, 1856; by Hamlet (8126)	50
Careless, roan, calved May 1, 1856; by Will Watch (12307)	42
Vesper, light roan, calved Sept. 3, 1856; by Will Watch (12307)	31
Singing Bird, red and white, calved September 20, 1856; by Will Watch (12307)	15
Verbena, white, calved Dec. 10, 1856; by Will Watch (12307)	16½
Firefly, light roan, calved Dec. 31, 1856; by Will Watch (12307)	17
Fruitful, red and white, calved June 1, 1857; by Duke of Daisies (14458)	15½
Camilla, red, calved Oct. 31, 1857; by Will Watch (12307)	35
Susey, light roan, calved Dec. 1, 1857; by Duke of Daisies (14458)	17
Venelia, red and white, calved Dec. 4, 1857; by Will Watch (12307)	20
Crystal, white, calved Dec. 15, 1857; by Duke of Daisies (14458)	18
Frolic, roan, calved Feb. 20, 1858; by Will Watch (12307)	23
Spinster, red and white, calved Feb. 25, 1858; by Will Watch (12307)	16
Verity, white, calved Feb. 22, 1858; by Duke of Daisies (14458)	19
Vine Leaf, white, calved May 11, 1858; by Duke of Daisies (14458)	20
Enemone, red roan, calved August 7, 1858; by Duke of Daisies (14458)	31
Rally, red and white, calved Dec. 25, 1858; by Will Watch (12307)	12
Careful, roan, calved Jan. 7, 1859; by Franklin (14569)	20
Grateful, white, calved Feb. 16, 1859; by Franklin (14569)	11
China Aster, roan, calved March 16, 1859; by Franklin (14569)	20
Flirty, red and white, calved March 20, 1859; by Will Watch (12307)	15½
Surprise, roan, calved May 1, 1859; by Franklin (14569)	15
Vanquish, light roan, calved July 11, 1859; by Strongbow (15350)	16
Veronica, red and white, calved June 26, 1859; by Will Watch (12307)	10
Fatima, red and white, calved Aug. 21, 1859; by Strongbow (15350)	9
Fortuna, red and little white, calved Sept. 13, 1859; by Strongbow (15350)	11
Ellen, red and white, calved Sept. 23, 1859; by Strongbow (15350)	3¼
Vestris, roan, calved Nov. 12, 1859; by Strongbow (15350)	11
Fantastical, roan, calved Dec. 2, 1859; by Strongbow (15350)	10
Fairy, white, calved Jan. 2, 1860; by Strongbow (15350)	5
Sukey, roan, calved Jan. 8, 1860; by Will Watch (12307)	9

BULLS.	
Will Watch, (12307), roan, calved May 19, 1851; by Vanguard (10994)	24
Strongbow (15350), roan, calved July 10, 1855; by Hamlet (8126)	37
Robespierre (15170), roan, calved Sept. 7, 1856; by Will Watch (12307)	31
Forester, red roan, calved March 8, 1858; by Duke of Daisies (14458)	24
Robin Hood, roan, calved March 24, 1858; by Will Watch (12307)	30
Fumigator, roan, calved Oct. 15, 1858; by Duke of Daisies (14458)	26
Prince Frederick William, roan, calved March 8, 1859; by Franklin (14569)	35
Harlequin, red and white, calved Sept. 29, 1859; by Will Watch (12307)	11
Fancy Boy, roan, calved Nov. 15, 1859; by Strongbow (15350)	14½

CALENDAR OF AGRICULTURE.

The sowing of all spring seeds is finished during this month, as barley, lucerne, and flax. Sow grass seeds or wheats and barley tilths, with light harrows and a heavy roll. Sow vetches for a second succeeding crop. Top-dress young grains and grasses, and shut up grass fields and meadows for hay.

Plant potatoes in drills 30 inches apart on lands well-wrought, cleaned, and dunged. Plant mangel-wurzel on lands similiarly prepared. Steep the seeds in suds or lees for 48 hours, and dry with quick lime. Apply a large quantity of half-rotten farm-yard dung, as potatoes and beet require a very ample allowance. Begin the burning of pared lands, which should be pushed during winter, or must be done quickly now; place the turfs in heaps, and burn moderately, in order to avoid calcination.

Horse and hand-hoe all drilled crops, as wheat, barley, beans, peas, and lucerne, and carrots if ready. Burn for manure, as ashes, peats, and all refuse vegetable substances, to be applied by the drop drill.

Fold the sheep, ewes and lambs, on early vetches, winter barley, rye, and watered meadows, or cut the food and give it to the animals in racks; confine the sheep at night in a fold, and allow two square yards of space to each animal, and two nights in one place. Cutting the food may be the most economical method.

The long days will now require more food for all animals on the farm. Feed cows with steamed food, roots, and chaff, bullocks with swedes and beet, and young stock with a quantity of the same. Give the oldest calves some of the earliest green food, to learn them to live without milk; use also bruised cake and linseed, and bean and barley meals.

Lambing will be finished in this month. Place the oldest on clovers as they get strong; cut turnips and beet into slices, and give them in troughs, mixed with oats and bruised oilcake. Spare no trouble nor expense with young animals.

Fat and aged cattle must now be all sold from the winter stalls; bacon hogs must be cleared off, and the young farrows must go on as summer stores, and for early fattening next winter. The earliest lambs will now be for sale as fat.

Begin to plough turnip fallows, and also clays, at convenient times. Carry to the heaps all dung remaining about the homestead, and litter the yards afresh.

CALENDAR OF GARDENING.

Sow peas—the scimitar as a profuse bearer, and broad beans, both as a succession at any period of the month. In the third week if the ground be rather warm and dry, plant the first crop of kidney beans. To prevent the early destruction by slugs and shell snails, sow three in a pot, late in March, or early in April, and when the plants are three or four inches high, place the stems in shallow trenches of good soil, a few inches apart, and the plants will thrive well; the same may be said of runners, which require watering in dry weather. An ounce of "pure" guano in two gallons of water, sprinkled on the plants, acts very well on the succulent leaves of beans, and also confers on the land small and extremely diluted portions of the contents of the guano. True guano, carefully applied, is a capital enricher of old and poor stable dung, horse droppings, and leafy composts.

Sow seakale seed early in threes, two feet apart, over-well wrought deep soil; sea weed is a good manure. Cover the seeds with an inch and a half of soil.

Asparagus beds are now prepared either by seed sowing in rows a foot apart, or by two years old plants. The ground cannot be too turfy, or too clear of stones, and if it be manured to the extent of full half the bulk of the whole earth, so much the better.

Sow also for main crops of cabbage, savoy, Scotch kale, winter and spring broccoli, spinach, beet, parsnip, carrot, and onion.

Potatoes: the main crop and the second early should be soon planted. All seed tubers should be rather immature: if planted whole, success is certain, though two-eyed tubers bear well.

Transplant cabbage, cauliflower, celery, and celeriac from the seed beds, to become stocky in intermediate beds.

FLOWER GARDEN.

Sow the annuals for summer as the main stock, or as a succession to those of March; propagate by slippings or rooted offsets the herbaceous tribes.

Weed, hoe, and rake, removing flower stalks by scissors.

Change frequently the situation of flowers, and the ground also, which must be renewed and timely enriched. The soil of parterre beds should be changed yearly, substituting new loam, decayed turf-leaf mould, old cow manure, and turfy heath soil, according to the known habits of each tribe of plants.

AGRICULTURAL REPORTS.

HEREFORDSHIRE.

The same ever-changing weather which proved throughout the past autumn and winter so injurious to the mangold, swede, and turnip crops, and alike trying to all other kinds of vegetation, continues up to the present period, and renders our former convictions of scarcity of keep but too fully realized. In every direction we hear serious complaints of this, consequently a considerable reduction in the price of both sheep and cattle has taken place, and as great numbers of half meated animals have passed into the hands of the butchers, those who can hold their stock a little longer will, we think, derive a great advantage. Our fairs have been largely supplied with store stock to be again sent home, or sold at prices which, we think, will eventually prove more beneficial to the purchaser than the seller. In our former report from this county, written on the 10th ult., we purposely refrained from saying anything respecting the young wheats, from the knowledge of the rapid change they make during favourable weather, and although six weeks have passed away, we can hardly say this change has yet taken place: they continue very backward, and we have heard some complaints of their perishing in the ground. The unfavourable nature of the weather prevented a large breadth of land from being planted in proper season: this has in many cases been put to other corn. The land after mangolds, swedes, and early turnips, usually planted with wheat, and by this season presenting a verdant appearance, is only now recently planted, or held over for barley: the relative price of that corn being higher than that of wheat causes the greatest demand for seed we have heard for some years; in fact, as we have before observed, at one period it was quite the exception to see a field of it growing upon a farm, and but few in a parish, the turnip land being all or nearly all put to wheat. From these causes combined, there will necessarily be a greatly reduced quantity of wheat grown in the county this compared with former years. Our winter beans are very backward, and in many places a partial replanting has taken place. We are of opinion there is much less corn in the hands of farmers than usual at this period of the year, although from the fact of two unusually early harvests and dry winters not requiring the straw, there was, when our last crops were secured, much old corn in the stacks: this, combined with a wet winter forcing the straw into consumption, and the new wheats, from the humid nature of the atmosphere, being out of condition, prevented speculation either with the farmer, miller, or factor, and thus the cause of the low price continuing so long with a deficient yield. The price of potatoes being now almost equal to that of wheat, and the thorough destruction of all kinds of green vegetables causing a greatly increased consumption of bread, together with the hitherto unfavourable appearance of the growing crops generally, must, we think, cause a continuance of the present upward tendency. If the past season has been injurious to our crops we are likely to receive a little compensation in the way of reduced labour upon our fallows, which we never remember to have seen in a more kind state. We hear of great losses of both ewes and lambs, and believe they were in a great measure occasioned by the previous wet seasons.—March 23.

HERTFORDSHIRE SOUTH.

In entering upon the spring quarter we sincerely hope that we have seen the last of winter, which for all purposes connected with farming and the care of live stock has been the longest and most trying in our recollection. Nor do we think the pinch has yet come, unless we are favoured with exceedingly fine and forcing weather, as all kinds of roots are fast being worked up, and how the sheep and cattle are to be kept until the grass grows is in every farmer's thoughts. The aspect of the country at this time is rather desolate, from the utter want of any green thing in our arable lands. Winter beans and winter oats alike cut a sorry figure, particularly on wet soils, and many fields of beans will not recover, having considerably lost plant. The wheat makes very slow progress, and much of it is unpromising. Several fields of autumn wheat have been ploughed up, and though it is too early to say what the crop may prove, at present the bulk of the fields of wheat are backward, thin, and sickly. Nor has the season been suitable for extensive planting of spring wheat. Though much has been sown, a considerable portion of the strong lands must be sown with oats or barley, the land being yet very wet and tender. As we have scarcely had two fine days together, no great progress had been made in the sowing of spring corn, which we have been compelled to put in by stealth, a day now, and a day then, the unceasing rain returning, at evening and entirely upsetting our arrangements for the following day. Light lands work well after a brisk windy day. The practice of scarifying winter-ploughed land previous to drilling, is on the increase. We think poppies, charlock, and other weeds are more effectually checked by the scarifier than by harrows alone, and, if practicable, we make a tilth for our peas, oats, and barley. Where a piece of swedes is yet standing, there is not a green shoot to be seen, and what is far worse, the swedes are little better than rotten roots, eked out for the sheep in the absence of other food. The only turnip we can hear of which has stood the winter is the old-fashioned green top swede, every other variety having failed. We have found a piece of drum-head cabbages of great value this season. Even now, some which were planted in August last are affording excellent keep for our ewes and lambs, and we dole them out with great care, scarcely knowing what to do with our flock when the cabbages are gone. This is the time to sow a seed-bed to raise cabbage plants for transplanting in June and July. Cabbage is a gross feeder, and those who purpose planting any should reserve a good supply of dung. Wurzel in clamp has wasted fully one-third, and many growers have lost half their produce. There will be a very small quantity of wurzel left in our neighbourhood at May-day. The violent storms of wind we have lately had have uprooted many large trees. We should not mind if the trees in our narrow lanes and hedge-rows were considerably thinned by this or any other process. In many places they stand so thick that nothing short of a convulsion of nature will move them. As a sample of our highways and byeways let us particularize the road known as "Blind Lane," in our locality. It is decidedly on the "narrow gauge," the hedges abounding in trees, nut bushes, and treacherous briars, which the unlucky traveller will find out to his cost; for if he do not keep his eyes open, he runs a serious risk of losing them. The twistings and turnings of our Blind Lane are of the true corkscrew character, and, as it belongs to nobody in particular, and we do not rejoice in a district surveyor, the hedges are never trimmed, the trees seldom lopped, and we have in vain endeavoured to ascertain the cultivation of the adjoining fields as we passed by. Our Blind Lane would not be complete without its dell-hole at one of the ugliest turns, with half-a-dozen trees growing about the dell, charitably left by the lord of the manor for the benefit of travellers on a dark night. We have blind hedges also, the making and repairing of which is the harvest of Hertfordshire woodmen. Every year these worthies require cart-loads of "stuff," with stakes and rods, to set our blind hedges to rights. A neat job is eventually made, and on completion, our woodman borrows a horse and cart of us, to clear away *his* "stuff," a very considerable quantity of chips. When will our landlords see the advantage of roads of a fair width, and good white-thorn hedges—an enduring fence? Another peculiarity in the farming of some parts of this county, especially about Hemel Hempstead and Market Street, is the leaving of a breadth of sward round the arable lands. Some years ago a friend took us over the now notorious Flamsteadbury Farm, then in the occupation of Mr. Overman, to show us how well the farm looked, and how liberally Mr. Overman treated his land. We were happy to bear testimony to Mr. Overman's skill and enterprise at that time, but having been accustomed to cultivate fields close up to stone wall fencing, and within two feet of hedges, we asked why the occupier left these 18 feet margins? We were informed that a clause is inserted in all leases and agreements in that locality which prohibits the tenants encroaching upon the "landlord's ride," and owing to the great quantity of hedgerow timber it would not pay to cultivate nearer if the tenants had the privilege of doing so.—March 24.

ISLE OF ELY.

The winter has lingered long, and appeared reluctant to take leave of us. It commenced with unwonted severity in October, for I find on the night of the 21st the thermometer fell as low as 26 degs., and on the 24th as low as 24 degs., and on the night of the 14th of the present month it reached 27 degs., and during the intervening five months cold and frost have prevailed. The winter has also been characterized by an unusual amount of downfall. From the 1st of February to the middle of this month, we have not had two successive days free from either frost or downfall—either snow or rain. Happily the last three days here have been more spring-like; the temperature has been higher, and the breezes balmy and genial. Vegetation is backward. The wheat plant has suffered rather less than might have been anticipated, although in some instances it looks weak and sickly. The plant on the fen soils looks stronger and more vigorous than it does on many of the strong tenacious clays. The frequent rains have suited the one, but have been too copious for the other. Undrained high lands—alas! some of these are even yet to be found—look miserably bad, and must yield a wretchedly poor crop. On some of our warm gravelly fen lands we see the wheat plant is commencing its spring growth, and with a continuance of suitable weather will soon assume a widely different appearance to that presented during the last six weeks. We have just commenced rolling our fen wheats. Friday last was the first day on which we could perform this most important work. We find the same operation last year was commenced on the 17th of February, and completed on the 3rd of March. We roll about 300 acres ourselves, and use the wheel rolls invented by the late Mr. Tupholme, of Horncastle. These work admirably, and give to the soil a solidity which is of immense service to the vigorous and successful growth of the plant. We employ nine horses in this work—three rollers with three horses each. The land becomes light as the frost lifts and raises it; and as this dries, it becomes dusty, frequently from two to three inches deep, which prevents the wheat from striking a strong root from near the surface of the ground, which it is wont to do at this season of the year. The roll overcomes this difficulty, but requires to be used before the surface becomes dry or dusty, and, indeed, should be done as soon as it will work clean. These two or three inches of raised soil, which would soon be mere dust, by this process are consolidated, and form firm and solid ground, in which the plant can strike its surface roots successfully, the result of which is a strong and vigorous plant. We commend the practice of rolling fen wheats with an uneven surface roller to all fen farmers. A smooth roller leaves the surface too level and fine, and which, with a strong wind, is very liable to blow. Fen farmers will understand this. Beans and peas are nearly all sown. The land has worked badly in many instances, and the work has been with difficulty accomplished. Oat seeding has commenced, and until the last few days has not done very well. The land has usually been too wet or too hard. Now, however, it is working admirably, and, with a continuance of the present weather, promise to finish much more satisfactorily than it began. Early sowing is still approved by the majority of our fen farmers, although the backwardness of the season has this year prevented many sowing as early as usual. The water-drill is a valuable implement in securing a good and rapid early growth of this crop on fen lands. Potatoes are now being planted, perhaps not so extensively as we have known on some former years. This root is scarce, and will be thoroughly used up this season; all other vegetables commonly in season at this time of the year being destroyed by the severe winter. Land is being prepared for mangolds, and we expect an unusually large breadth of this crop will this year be sown. The root has become so invaluable and so essential to our successful farming, that we anticipate a greatly extended cultivation of it. Keep is becoming scarce, and our farmers are anxiously looking for grass-growing weather, to help them out of their difficulties. Store sheep are not a brisk sale at present, although we cannot avoid the opinion that sooner or later they will be very high—wool and mutton point to this; sufficiency of grass food is the only thing required to occasion it. When this is realized, we believe extravagantly high prices will prevail. The corn trade steadily improves. Wheat sells more freely, at rather higher prices. Stocks of old wheat are working off, and the deficiency of the last harvest is becoming more felt, and will be increasingly so as the summer advances. It would not take much to occasion some considerable advance in prices.—March 19.

SUFFOLK.

The past winter having been long, and at times extremely severe, the wheat plant presents a backward and unpromising appearance: it is far from winter-proud, scarce a blade can be seen. We do not argue from this fact that the yield will be deficient at harvest; our experience leads us to no such a conclusion. We have reaped abundant crops after a poor promise in appearance at spring. As the season is backward, we strongly recommend a thorough examination of the wheat fields generally, that the insidious wire-worm may be discovered where he is committing his frightful ravages unchecked. So much have we suffered in a late spring from the wire-worm, that we especially caution our friends to satisfy themselves upon this point. Much spring corn—peas, beans, and barley—have been drilled within the past few days, and the land has proved in excellent tilth, well frosted, and dry. The work of the country was in a very backward state, and the chance to make progress has been eagerly embraced. The lambing season has very generally commenced; and we hear of the same variations in individual success, as usual—good, bad, and indifferent. Success, or unsuccess, is termed luck; but there is never an effect without a cause, and it is the best physiological course of management which insures the best result. We urge a more thorough investigation of the cause of failure (the loss of ewes and lambs, &c.); and it is our experience that it may usually be traced to defective management; perhaps to too great care—ewes too fat, or, the contrary, too poor: perhaps feasted at one period, and stinted of food at other times. We are convinced one great error is in giving too much root, especially if frosted. Ewes require a large amount of dry fodder, such as straw, to pick over, and straw-chaff, with a small admixture of hay or malt-combs, and but few roots. Our experience has been that the larger the amount of dry food consumed, the better the health of the ewe, the stronger the lamb, and the more easy the parturition. Even our heath and park-fed ewes are a proof the advantages of dry food. The losses from such fed flocks are usually at a minimum; and we have suffered severely in our flocks and pockets from leaving the semi-dry food system carried out at our own homestead and farm to feed turnips elsewhere at a *gift*. Surely some flockmasters both can and will give us the result of their experience. I could point my finger to the names of twenty men, and more, whose experience would be invaluable towards solving the question of ewe management, of course upon a broad basis; but we want such men to place their experience on record, that important inferences and sound conclusions may be deduced from a combination of such important facts as practice alone can furnish. We consider the present lambing season beyond the average in casualties; and we attribute it to the unusually decayed condition of the turnip crop. Feed is becoming scarce, and already influences the trade in hoggets and keeping sheep, giving it a downward tendency. Should the weather continue cold and backward, much difficulty will be experienced in finding a supply of food, especially for the flocks. We are convinced that in such a case nothing answers better than a small outlay in artificial and nutritious food for lambs, rather than allowing them to become stunted in their growth for the want of it. It is possible to be penny wise and pounds foolish. Some heavy losses of beasts have occurred throughout the winter from pleuro-pneumonia. The three great agricultural topics of conversation are, The malt tax, and its injustice; Mr. Corbet, and his truthful exposure of the evils resulting from the abuse of game-preserving; and, Mr. Mechi and his balance-sheet. Of the last named, it is perfectly clear Mr. Mechi has deluded himself (but no one else) into the notion that his farm has paid him a per-centage profit. It is certain, from Mr. Mechi's own published statements, it has not paid him the common market value of his money. Mr. Mechi has not made 5 per cent. per annum of his invested capital. We trust Mr. Mechi will place his entire accounts as landlord and tenant before the public, as much for his own reputation as for the cause of truth and progress.—March 23.

MID-KENT.

Now that the political agitation, consequent on the alteration of the hop duties, is subsiding, and the ordinary routine business of the season urges action instead of agitation on our part, we are beginning to make up the lost time caused by the wet and changeable weather we have so long encountered prior to the 12th inst., when it became somewhat finer; but the wet days alternating with frosty nights delayed work very much, so that much of the hop and fruit-orchard digging, which ought to have been done long ago, is yet to do, and consequently all hands are busily engaged. Ploughing is a little in advance of digging, and some of the Lent corn crops have been sown on the dry lands; but in most places the ground is very cold and wet below, and things are likely to be late. The grass, which is everywhere very short, and has been closely fed off during the winter, has scarcely advanced the least yet, and as swedes and mangold wurzel are very scarce, sheep feed is at a premium. Great complaints of the swedes rotting reach us daily, and we are in a bad position for maintaining our lambs unless aided by fine weather to make the grass grow, and as most of the neighbouring flocks have not lived too well during the winter, we are in a bad position for the future. But sheep are in general healthy, and it is to be hoped that as the season is so far advanced finer weather will follow. In the fruit orchards there is a fair promise of a crop, and with favourable weather during the blooming period we may perhaps be rewarded by a fruitful year; and as the last two or three seasons have been almost total failures, we may reasonably expect a more abundant one this time. The past winter, by the copious rains and floods with which we have been visited, has revived the subject of draining again, which the three preceding dry seasons had to a certain extent rendered unnecessary; but the extreme wetness of some undrained ground the present month, compared with others that is drained, has been noticed in the right quarters, and drain pipes in scattered heaps are to be seen in many fields, showing that draining is going on. But, on the other hand, the rain that has fallen has been of great use in replenishing our wells, streams, and ponds, and the outcry there was for water a few months ago has ceased, and it is not likely to be repeated the ensuing summer. On the other hand, roads both public and private have suffered much by the frequent changes, and at the present time they are in a very indifferent condition to go through the summer; and the want of labourers to the many branches of husbandry now necessary to get on with, prevents their being drafted into this channel; but a month of fine weather will make a change, and we hope to escape any more floods the present spring, as well as severe frosts after the middle of April, as the latter evil proved fatal to many of our prospects last year, and to it is justly attributed the scarcity and conequent high price of fruit the past and present seasons.

J. R.

WEST GLOUCESTERSHIRE.

The severe changes of weather which have characterized the winter have continued to the present time. A succession of sharp frosty nights, tempestuous winds, and often heavy rains succeeding, have naturally delayed the operations in husbandry which are wont to be performed in the month of March. "The peck of dust," proverbial to the month, has not been experienced; cold winds have exercised their influence in partially drying the soil; but they have been followed by rain, and the hope of one day has been banished by the inclemency of the next. The wheat plant has undoubtedly suffered. In many instances the seed-time was delayed beyond the usual period, and the result is that the blade is only just showing through the surface. In cases the most favourable the plant exhibits anything but a flourishing aspect. Winter-proud wheat is nowhere to be seen. Copious top-dressings of artificial manures will be in requisition, and with a favourable summer it is just possible that an average crop will follow; but it is yet too soon to express a positive opinion on that point. Let us, however, live in hope. The grass lands, from the same cause, are barren in the extreme; quite the reverse of the luxurious promise of the two last years. Keep for stock is therefore scarce and costly. The hay crops of last summer were fortunately productive, as heavy contributions have been levied on the rick yards, and many dairy farmers are compelled to purchase. Unless a favourable change takes place, it will be late in the spring before a bite of grass can be expected. These are not pleasing prospects, but stern reality compels the narrative. The markets for wheat are slightly improving; but sales of store stock are very inactive. Cheese and butter are advancing, with promise of increasing prices. Potatoes are not so scarce as at one time anticipated, and in the face of the planting season they are obtainable at reduced rates. Ten to twelve shillings the sack are the best prices for choice sorts. Garden productions, so acceptable at the approaching season, will be a general failure: scarcely a single brocoli plant has escaped the rigour of the frost, and most of the varieties of spring greens have suffered from the same cause. It would be speculation in the extreme to predict the prospect of a crop of fruit, though appearances indicate the probability of a favourable hit.

GENERAL AGRICULTURAL REPORT FOR MARCH.

Owing to the continuance of cold northerly winds, vegetation has made very little progress during the past month, even in our most forward districts. The backward appearance of the young wheats has, in many instances, given rise to unfavourable reports in reference to the prospect of the next yield; but, at present, we see no reason why a short crop should be anticipated as the result of a backward spring, because, as far as we can ascertain, no actual damage has been sustained by the winter wheats, and because the breadth of land under cultivation is fully equal to most previous years. However, the wheat trade has now become more healthy than for some time past; prices continue to rise, and very few of the growers or importers are willing to sell, except at further enhanced rates. That there is ample room for even higher rates does not admit of a doubt, since the importations from abroad are likely to be very moderate for some time, and as our farmers will be much occupied in the sowing of Lent corn between this and the end of April. In that period, our markets will be scantily supplied with wheat, there will be a considerable reduction in the supplies of foreign produce in warehouse, not only in London and Liverpool, but likewise at Hull, Gloucester, &c., and consumption, under the influence of a moderate range in the value of money, and of an enormous home trade, will continue large. These features seem to point to further enhanced rates for wheat; but our impression is, that we can hardly anticipate excitement in the demand, or a range in value much above 60s. per qr. for the best white qualities.

The sowing of Spring corn has been delayed to a much later period than usual, owing to the saturated condition of the soil. There is, however, nothing to fear on this head; in other words, we do not anticipate any great falling off in the yield from this circumstance. The supplies now in stack in all parts of the United Kingdom are very moderate; and the quantities of barley on offer since we last wrote have fallen off considerably. The consequence is, that much difficulty has been experienced in obtaining adequate supplies for seed and malting purposes, and the value of all kinds has ruled high.

As regards potatoes, we may observe that fair average supplies have appeared on sale in our leading markets, in, for the most part, very middling condition. Good sound qualities have changed hands freely, at from 140s. to, in some instances, 160s. per ton; but other kinds have moved off slowly, at about previous rates. The stocks in growers' hands are now reduced to a somewhat narrow compass, and we regret to state that a portion of them is unfit for human consumption; hence unsound qualities will now chiefly be consumed in dairies. Our advices from the continent are to the effect that very few potatoes are now on hand; so that we cannot suppose that any addition will be made to our supplies from that quarter. This comparative deficiency in the arrivals of potatoes may tend to impart additional firmness to the wheat trade, both here and in the continental markets, where, since the commencement of the year, prices have advanced fully 6s. per qr

We understand that very large orders for the purchase of wheat have lately been forwarded to the various Baltic ports, for shipment on the re-opening of the navigation. We may, therefore—especially as stocks have accumulated in the North of Europe—anticipate somewhat heavy importations during the summer months. Shipping is now abundant, and the rates of freight are very low; but we must bear in mind that the arrivals of both wheat and flour from the United States—notwithstanding that the supplies of the former in the hands of the growers are still very large—will be limited, arising from the high quotations in the American markets, and the extent of the speculative investments by wealthy holders. It is a remarkable fact that, during the last two years, the produce of spring corn throughout the world has not kept pace with the actual wants of the trade. The consequence is, that the value of barley, oats, beans, and peas has ruled relatively higher than wheat, and that our maltsters have been compelled to pay enormously high prices for barley. This state of things, as regards value, is not likely to be improved even by increased importations from abroad, since it is quite evident that we are now in a position to consume every bushel that the continent can spare for us. Winter food has not lasted quite so long as could have been desired. The large numbers of beasts now in process of stall-feeding have, of course, tended to increase the consumption of turnips, beet, &c.; nevertheless, there is no actual scarcity to be complained of, owing to the great abundance and the good quality of last year's crop of hay.

The wool trade has continued in a healthy state, at prices fully equal to those current in the previous month. The public sales of Colonial wool, at which about 40,000 bales were disposed of, have gone off remarkably well, at extreme quotations. The business transacted by private contract, however, has been very moderate, and wholly confined to immediate wants. Manufacturers, generally, complain that hitherto they have not been able to obtain an advance in the value of the manufactured equal to the rise in the raw material, and hence, that they have been compelled to decline buying beyond actual necessities, in order to keep their mills going. The result is, that there is now scarcely any stocks of woollen goods on hand, and should an active demand spring up the quotations must advance considerably. The arrivals of wool from our colonies have rapidly increased during the past fortnight, and there are now in warehouse fully 20,000 bales for sale. That quantity, including the whole of the fresh importations, will be offered at auction in May next.

Only moderate supplies of hay and straw have been on sale in the metropolitan markets, and the trade generally has ruled active on higher terms. Meadow hay has sold at from £3 to £4 15s., clover from £4 to £5 10s., and straw £1 7s. to £1 14s. per load.

The fat stock markets have been fairly supplied with beasts and sheep, in, for the most part, fair condition. Trade generally has continued in a healthy state, and prices have continued to rule high. The consumption of meat throughout the country is still very large.

The Scotch markets have been moderately well supplied with produce. Wheat has commanded rather more money, and the value of spring corn has been fully supported. The shipments to the south have continued on a liberal scale. The stocks of grain on hand are still large for the time of year.

In Ireland more money has been paid for wheat, but the demand for that description of produce has been by no means active. Fine barley and oats have commanded extreme rates, and the transactions in Indian corn have somewhat increased. Very little grain has been forwarded either to England or Scotland, and the importations from the westward have been only moderate.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that full average supplies of stock have been on offer in the various markets, and that the imports from abroad have continued on a liberal scale for the time of year, the trade has continued in a healthy state, and, on the whole, prices have been well supported. Most of the beasts have appeared in good saleable condition, and the general weight and quality of the sheep have shown signs of improvement. We may observe, too, that the foot disease has shown less virulence in our leading grazing districts; consequently the losses have been comparatively trifling. The consumption of meat is still very large—a proof that trade is in a flourishing state; prices rule high, and it may, we think, be taken for granted that no decline of importance will take place in them during the present year, even though we may receive large additional supplies from the Continent. From some quarters complaints of the scarcity of stock have reached us; nevertheless, we believe that there are now larger numbers of beasts in the stalls than have been known for many years past at this period of the year.

Letters from Holland state that a considerable improvement has taken place in the health of the stock—that heavy shipments will be made to England next month—and that prices are still high. In Germany large numbers of sheep are ready for the English market; but one would almost imagine that the low prices realized for them in London would entirely check shipments. However, they will, no doubt, be made, even though the owners receive very little over 15s. for each head of stock forwarded to London, after deducting the expenses of freight, commission, and other charges. The imports into the metropolis have been as under:

	HEAD.
Beasts	1,084
Sheep	8,498
Calves	636
Pigs	241
Total	10,459
Same time in 1859	10,548
„ 1858	1,511
„ 1857	5,419
„ 1856	1,842
„ 1855	2,103
„ 1854	8,409
„ 1853	10,884
„ 1852	6,747

The total supplies of stock, derived from all sources, exhibited, have been:

	HEAD.
Beasts	18,160
Cows	495
Sheep and lambs	93,409
Calves	853
Pigs	2,042

COMPARISON OF SUPPLIES.

	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1859......	16,810	612	94,775	695	2,890
1858......	17,821	476	74,410	704	1,915
1857......	17,345	490	74,880	1,118	2,230
1856......	22,623	470	100,700	797	2,140
1855......	18,644	380	88,790	834	2,765
1854......	20,588	532	93,060	1,091	2,780

About 11,600 Scots, crosses, and shorthorns have come to hand from Norfolk, Suffolk, Essex, and Cambridgeshire; 2,200 various breeds from other parts of England; 750 Scots and crosses from Scotland; and 738 oxen and heifers from Ireland. The crosses have arrived in first-rate condition, especially those from Scotland, and which have been chiefly consigned to Mr. Dickson, of the Metropolitan Market.

The general range in the value of each kind of stock has ruled as under:

	s.	d.		s.	d.
Beef, from	3	4	to	4	10
Mutton	3	8		5	10
Lamb	5	8		6	8
Veal	4	8		6	0
Pork	3	6		4	10

COMPARISON OF PRICES.

	March, 1856.						March, 1857.				
	s.	d.		s.	d.		s.	d.		s.	d.
Beef, from..........	2	10	to	4	10	...	3	4	to	5	0
Mutton	3	2		5	2	....	4	2		6	0
Veal	4	10		6	0	....	4	4		5	8
Pork	3	4		4	8	....	3	6		5	2

	March, 1858.						March, 1859.				
	s.	d.		s.	d.		s.	d.		s.	d.
Beef, from..........	2	10	to	4	6	....	3	6	to	5	2
Mutton	3	0		5	2	....	4	0		6	0
Veal	4	0		5	2	....	3	10		5	8
Pork	3	0		4	4	....	3	4		4	4

Notwithstanding that very large supplies of Scotch and country-killed meat have been received up to Newgate and Leadenhall Markets, a steady business has been passing generally; nevertheless, in some instances the quotations have had a drooping tendency.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ABERGAVENNY FAIR.—There was a very good attendance of horned stock, both stores and fat. Stores were, however, owing to the high and increasing price of hay, and the scarcity of swedes, not much in demand, those sold being at a considerable discount. Fat stock sold pretty freely at prices varying from 6¼d. to 6¾d. per lb. There was a capital attendance of draught horses, many of which changed hands at good prices. The supply of nag horses was very limited.

BARNSTAPLE GREAT MARKET.—The supply was quite equal to previous occasions, and the cattle in good condition; dealers were not numerous, but much business was transacted. Beef about 11s. per score, and mutton from 7d. to 7½d. per lb., nott couples 32s. to 40s., and horn ditto from 36s. to 46s.

COUPAR ANGUS HORSE MARKET.—The turn out was large, and for first-class horses high prices were given. Messrs. M'Gregor and Thomson, Perth, sold one fine-looking animal at £60 and £2 back. They likewise sold a few others at upwards of £50. From the backward state of labour at this particular season, useful horses were in much request, while from the scarcity of keep other sorts were not much inquired after. There was a fair turn-out of cattle. Prime fat was selling high, while winterings or grass beasts were not much sought; and even calving cows, though much needed at this season, yet, from the scarcity of keep, were stiffer than usual.

GLASTONBURY MONTHLY MARKET was unusually large, particularly in young beasts and store pigs. The market altogether was brisk.

GLOUCESTER MONTHLY MARKET.—Business both in Beef and Mutton ruled heavy, and trade was very dull, former prices not being obtainable, and several lots remained unsold. Good Beef realized 7d., inferior 6d. to 6½d. per lb.; Mutton in the wool fully 8d., shorn Sheep 6½d. to 7d. per lb.; Pigs, 9s. 6d. to 10s. 6d. per score.

NEWPORT (ISLE OF WIGHT) FORTNIGHTLY CATTLE MARKET.—Wether mutton 6d. per stone, beef 12s. 6d. per score, lamb about 6s. per stone.

SHEPTON MALLET MONTHLY MARKET.—There was more stock exhibited for sale than at any previous market. Good cows and calves fetched from £14 to £18, two-year-old heifers £8 to £10, sheep from 32s. to 45s., and yearlings from £4 to £5.

HELSTON FAIR.—There was a very small supply of cattle; and buyers not being numerous, the amount of business transacted was very limited.

ROSS FAIR.—There was a plentiful supply; but, in consequence of the shortness of keep, the demand was limited, except for meat fit for the butcher. Prime quality of mutton in the wool realized 7½d., beef 6½d. per lb. Good horses were sought, but inferior animals were a drug.

SHREWSBURY GREAT HORSE FAIR.—The selling prices of horses may be quoted as follows: Selections of young horses for pair harness 65 to 75 guineas; matched pairs ranged in prices from 160 to 220 guineas the pair; quick, active-stepping horses, for broughams and light harness, made from 45 to 60 guineas; unbroken colts of this class made figures varying from 38 to 45 guineas; thickset young horses, suitable for van purposes and carriage work, realized 26 to 38 guineas, and fashionable high-stepping cattle, for phaeton and single harness, made from 50 to 75 guineas; saddle horses varied in prices from 48 to 60 guineas; blood horses of high pedigree were selected at very high prices; horses adapted for the hunting field ranged in prices from 85 to 160 guineas; cart-horses, light-built easy walkers, suitable for town work, fetched from 35 to 45 guineas; matched teams 50 to 60 guineas a horse; seasoned horses for agricultural work 25 to 35 guineas; cart colts 20 to 35 guineas; yearlings 15 to 18 guineas; brood mares to foal down 20 to 28 guineas; well-bred ponies made from 10 to 15 guineas; thick-set cobs, for which this county (Shropshire) is famed, commanded a very good sale at prices varying from 18 to 24 guineas; and compact cobs, up to heavy weight, made 28 to 35 guineas. All useful descriptions of horses were sold at remunerating prices to breeders, and, although this county does not rank first as a horse-breeding district, yet great improvements are annually made in the breeding of horses, and many most valuable animals were sold at this spring fair.

STAMFORD FAIR.—There was an average show of sheep. Sellers start with such high prices that trade was inactive for a time; subsequently, rather lower rates were quoted, and sales were consequently more brisk. Great loss has recently been experienced by dealers. We are told that within seven miles of Kibworth upwards of 4,000 sheep have died since Michaelmas. Similar causes caused the high prices we have alluded to. Useful lamb-hogs made from 40s. to 50s., in one or two instances 53s. were obtained, inferior about 34s.; fat sheep (a few) clipped 7d., in the wool 8d. per lb. There was a small show of beasts, and very few transactions took place. Full rates were obtained for fresh beasts, but inferior animals were a drug.

TENBURY FAIR was thinly supplied with every description. Mutton averaged 7½d., and beef 6d. per lb. Barren stock about the same,

TEWKESBURY FAIR.—There was a great supply of stock, especially sheep, it being estimated that upwards of 2,000 of the latter were penned. Store stock was almost a drug in the market, and it was with great difficulty, and at very low prices, that any was disposed of, owing, no doubt, to the scarcity of keep. There was a good demand for fat meat, but sellers had to submit to a reduction in price. Mutton sold at from 7d. to 7½d., and beef at from 6d. to 7d. per lb. The horse fair was unusually well supplied with all sorts and sizes; good cart horses fetched long prices, but there was a small demand for other animals.

TORRINGTON GREAT MARKET.—There was a large supply of cattle, and also a good attendance of purchasers. The sales were not so numerous nor the prices so high as the preceding year, and prices were as follows: Oxen, from £15 to £22 each; steers, two-years-old from £7 to £10 each; three-years-old ditto, £8 to £15 each; barreners, £8 to £18 each; fat bullocks, from 10s. 6d. to 11s. per score; cows and calves, £11 to £16; fat sheep 7½d. per lb.; hoggs, £1 5s. to £1 10s. 6d.; ewes and lambs, £2 2s. to £2 12s. each.

TRURO FAIR.—There was a pretty good supply of fat beasts, which sold at from 56s. to £3 per cwt. Working oxen and steers were in tolerable demand, and sold at high rates. Other store cattle were not in request. Fat sheep, of which the supply was limited, were worth about 8d. per lb.

WORCESTER FAIR.—The show of fat stock was good; stores were plentiful, and the attendance of buyers was very good. Beef made from 6½d. to 7d. per lb., and mutton 6½d., shorn; in the wool, 7½d. to 8d., and all sold: stores were some little lower, in consequence of the shortness of keep. Pigs, 10s. 6d. to 10s. 10d. per score; stores very dear.

IRISH FAIRS.—ATHLONE: Store cattle were £1 a head under last year. There were several lots of stall-feds, which were bought up at prices which were considered remunerative to holders. The sheep market was not only under the usual supply, prices were at least from 1s. to 1s. 6d. under what were obtained this time twelvemonths. The lambs were very short of the usual supply. The average prices were 37s. each. Few lots were sold. Pork went so high as from 47s. to 50s. per cwt. The horse fair was a great falling-off in supply. Mr. Henry Reynolds, of Dublin, bought for the military at from £25 to £30. Mr. Thomas Gannon refused £50 for a bay hunter.

THE HEREFORDS IN JAMAICA.

SIR,—As great efforts have for some years past been made to improve the breed of cattle in Jamaica by selecting Hereford, Shorthorn, West Highland, and Devon bulls from the herds of this kingdom, it may be interesting to some of your readers, particularly the Hereford breeders, to know the success which has attended the introduction of the Herefords into that colony by Mr. John Edwards, a native of this county, who is now managing the extensive possessions of John Malcolm, Esq., in that island, and who purchased the Hereford bull Sir Oliver (1732), bred by Mr. T. Rea, of Westonbury, which was exhibited at their agricultural show on the 3rd of February last, and won the first prize of £15 as the best imported bull of any breed. This gentleman also won the following first prizes with cross-bred animals of the Hereford and native breed, viz., best bull calved in 1856, £15; best bull calved previous to 1856, £15; best cow exceeding 6 years old, £10; best heifer in calf, £10; best lot of eight steers, £10; best cow for dairy purposes, £5; best fat steer, £10.

Thus have our beautiful animals again refuted the statements we have heard and read, that they will not do out of their own locality, and proved that the exercise of sound judgment by those to whose care their selection is intrusted is all that is required to insure their winning equal laurels, even in tropical climates, to those which have been so frequently for many years awarded them at the principal shows of this kingdom. T. DUCKHAM.

Baysham Court, Ross, Herefordshire, 13th March.

ROLLING AND HOEING WHEAT.—The continual cold rains and frosts without snow this winter have, drenched and lifted the wheat plants too much for their own good on light and shallow soils, in some cases almost out of the ground, causing in them a sickly and unpromising appearance. Such, however, as were early sown on deeper and well cultured subsoils (which unfortunately are but few this season) have obtained a firmer hold, and are progressing more favourably in Essex, since the cold rains and frosts have subsided. As there are but few winter weeds this spring, we think it advisable to hoe it but little if at all (especially as labour is scarce and dear), believing it would only tend to still loosen it more; indeed, it is questionable if even harrowing will not cause it to be much more rootfallen, the land being so unusually puffy. To remedy the evil we intend immediately to only well and repeatedly roll all our own down tight, *surface* solidity now for wheat, with deep subsoil tillage, being our motto. At all events, where it is thought best to hoe or harrow it, rolling it down firmly directly afterwards is an important point, and never ought to be neglected; but it is certainly best policy to roll wheat just as it is renovating, and not later.—HARDY & SON, Seed-growers, &c., Maldon, Essex, March 19.

THE BIRMINGHAM CATTLE AND POULTRY SHOW.—Mr. John Baker Lythall has been elected Secretary of this Society. His chief opponent was Professor Tanner, sixteen members of the council voting for the one, and eleven for the other.

STALLIONS FOR THE SEASON, 1860.

Name.	Colour.	Age	Pedigree.	Performances.	Principal Performance.	No. of Winners out by	Sire of	Standing at	Apply to	Price.
Acrobat	bay	9	by Ithuriel, out of Tour-de-Force, by Sir Hercules	started 19, won 12	won Great Yorkshire Stakes	untried.	—	Roydon, Diss	G. Sturgeon	10 gs.
Adamas	bay	6	by Touchstone, out of Ada Mary, by Bay Middleton	started 22, won 6	ran third for the Derby	untried.	—	Theobald's Farm, Stockwell	—	8 gs.
Alarm	bay	18	by Venison, out of Southdown, by Defence	started 17, won 13	won Ascot Cup	48	Frantic	Newmarket	Messrs. Barrow	10 gs.
Alderman, The	bay	5	by Knight of Avenel, out of Manœuvre, by Rector	started 7	—	untried.	—	Tupgill, Middleham	—	
Alembic	bay	9	by Touchstone, out of Latitude, by Langar	started 39, won 6	won the Ham	untried.	—	Killynon, Ireland	—	6 sovs., h. b. 3 sovs.
Alonzo	chesnut	13	by Alpheus, out of Zarina, by Morisco	started 70, won 21	won Doncaster Handicap	untried.	—	Delamere, Tarporley	Mr. Hocknell	7 gs., h. b. 3 gs.
Ambrose	black	11	by Touchstone, out of Annette, by Priam	started 19	—	4	Cynricus	Burghley, Stamford	Mr. H. Rose	20 gs.
Annandale	brown	18	by Touchstone, out of Rebecca, by Lottery	started 15, won 3	ran second for Derby	44	Apathy	Halleathe, Lockerbie	Mr. R. Scott	10gs., h.b. 5gs. (30 m.)
Antinous	bay	5	by Bay Middleton, out of Ægis, by Defence	started 1	—	untried.	—	Longstock, Stockbridge	—	10 gs.
Artillery	bay	7	by Touchstone, out of Jeannette, by Birdcatcher	started 21, won 7	won the Criterion	untried.	—	Sark Lodge, Curragh	—	6 gs.
Assayer, The	brown	9	by Melbourne, out of Pickledust, by Launcelot	started 51, won 17½	won Londesborough Cup	untried.	—	Kelso	Mr. Rathie	5 gs., h. b. 3 gs.
Attorney General	brown	6	by Melbourne, out of Betsy, by Cato	started 19, won 2	won £75 at Malton	untried.	—	Alnwick	Mr. Atkinson	
Audubon	bay	10	by Birdcatcher, out of Lucy Dashwood, by Sheet Anchor	started 39, won 13	won Cleveland H.	untried.	—	Lismany, Ireland	—	5 sovs., h. b. 2 sovs.
Augur	chesnut	11	by Birdcatcher, out of Nickname, by Ishmael	started 4, won 3	won Champagne Stakes	9	Soothsayer	Beverley	D. Price	10 gs.
Autocrat	bay	9	by Bay Middleton, out of Empress, by Emilius	started 5, won 3	won the New Stakes	1	Lord Palmerston	Lymington	Mr. Thorn	10 gs.
Backbiter	brown	15	by Gladiator or Don John, out of Scandal, by Selim	started 24, won 5	won Goodwood Stakes	1	Antic	Warford, Knutsford	Mr. Makin	8 gs., h. b., &c., 4 gs.
Barbarian	bay	11	by Simoom, dam by Buzzard	started 5, won 1	ran second for the Derby	5	Peri colt	Atkinton, Tarporley	J. Owen	10 gs., h. b. 3 gs.
Barnton	bay	16	by Voltaire, out of Martha Lynn, by Mulatto.	started 3	—	9	Fandango	Wentworth, Rotherham	E. Oates	12 gs.
Beadsman	brown	5	by Weatherbit, out of Mendicant, by Touchstone	started 12, won 5½	won the Derby	untried.	—	Leybourne, Maidstone	Mr. Tweed	20 gs.
Black Prince	black	18	by Touchstone, out of Queen of Trumps, by Velocipede	started 1	—	1	Liberty	Water Tower, Rugby	Walker & Watson	5 gs., h. b. 2½ gs.
Blackthorn	brown	5	by Buckthorn, out of Pasquinade, by Camel	started 23, won 5	won Shrewsbury Handicp	untried.	—	Halling, Strood	—	5 gs.
Bobby (Galloway)	bay		by Round Robin, dam by the Arabian Borack		won several steeplechases		—	Emmett's, South Molton	Mr. R. Smith	2½ gs. (25 mares)
Bonnie Morn	grey	8	by Chanticleer, out of Forget-me-not, by H. Platoff	started 8, won 6	won Champagne Stakes.	untried.	—	Woolaton, Nottingham	Mr. Harrison	7 gs., h. b. 3 gs.
Brocket	bay	10	by Melbourne, out of Miss Slick, by M. Moloch	started 7, won 3	won Royal Hunt Cup	5	Queen of Wake.	Denham, Uxbridge	Mr. Wheeler	5 gs., h. b. 3 gs.
Cannobie	bay	7	by Melbourne, out of Lady Lurewell, by Hornsea	started 5, won 2	won Metrop. Handicap	untried.	—	Cawston, Rugby	W. Hemming	12 gs., h. b. 6 gs.
Canute	chesnut	9	by The Emperor, dam by Economist	started 8	taken 8 prizes	untried.	—	Pickering, &c.	Mr. Webster	5 gs., h. b. 2 gs.
Cavendish	brown	4	by Voltigeur, out of The Countess of Burlington, by Touchstone	started 3, won 1	won Convivial Stakes	untried.	—	Boddicott, Banbury	W. Mace	10 gs.
Chanticleer	grey	17	by Birdcatcher, out of Whim, by Drone	started 37, won 21	won Doncaster Cup	69	Sunbeam	Croft, Darlington	T. Winteringham	25 gs. (40 mares)
Charlesten	bay	7	by Sovereign, out of Millwood, by Monarch		ran well in America	untried.	—	Newmarket	Messrs. Barrow	25 gs. (30 mares)
Chevalier d'Industrie	chesnut	6	by Orlando, out of Industry, by Priam	started 14, won 3	won the Gratwicke	untried.	—	Salvington, Worthing	Mr. J. Mitchell	5 gs., h. b. 2 gs.
Claret	brown	8	by Touchstone, out of Mountain Sylph, by Belshazzar	started 27, won 8	won G. Duke Michael	untried.	—	Curragh of Kildare	Mr. Clancy	10 gs.
Colonist	bay	6	by Melbourne, out of Forget-me-not, by Hetman Platoff	started 2	—	untried.	—	Spofforth, Wetherby	Mr. Groves	
Colsterdale	brown	12	by Lanercost, dam by Tomboy	started 32, won 7	won Liverpool Cup	1	Shafto	Sledmere, Malton	—	15 gs., h. b. 5 gs.
Corœbus	bay	8	by Slane, out of Gala, by Galaor	started 17, won 4	won Bentinck M. S.	untried.	—	Halliford, Sunbury	Mr. Carter	10 gs., h. b. 3 gs.
Cotherstone	bay	20	by Touchstone, out of Emma, by Whisker	started 11, won 7½	won the Derby	70	Glauca	Althorp, Northampton	T. Wilson	10 gs. (20 mares)
Cowl	bay	18	by Bay Middleton, out of Crucifix, by Priam	started 8, won 5	won Buckenham Stake	30	Madam Eglantine	Newmarket	Messrs. Barrow	12 gs., h. b. 3 gs.

Cure, The	brown	19	by Physician, out of Morsel, by Mulatto	started 26, won 16	won the Claret	27	M. D.	Angel, Catterick	Mr. Ashton	25 gs. (45 mares)
Dagobert	bay	10	by Ion, dam by Langar	started 12, won 3	won Chesterfield Stakes	untried.	——	Mill End, Henley	H. Harvey	2 gs.
Daniel O'Rourke	chesnut	11	by Birdcatcher, out of Forget-me-not, by Hetman Platoff	started 10, won 2	won the Derby	10	Gaspard	Sledmere, Malton	——	10 gs., h. b. 5 gs.
De Clare	bay	8	by Touchstone, out of Miss Bowe, by Catton	started 4, won 3	won Newmarket Stakes.	untried.	——	Cross Keys, York	Mr. Pearson	10 gs. (40 mares)
De Ruyter	bay	12	by Lanercost, out of Barbelle, by Sandbeck	never appeared	——	6	Lady Elizabeth	Redlands, Reading	J. Dibben	10 gs.
Ditto	bay	5	by Orlando, out of Ortez, by Melbourne	started 10, won 2	won £300 at Newmarket	untried.	——	Rawcliffe, York	T. Baitson	5 gs., h. b. 2½ gs.
Drayton	brown	23	by Muley, out of Prima Donna, by Soothsayer	never appeared	——	10	Bourton	Orlingbury, Wellingbro'	Mr. Manning	10 gs., h. b. 3 gs.
Dr. O'Toole	chesnut	9	by Birdcatcher, out of Dahlia, by New Fashion	started 22, won 7	won £160 at Curragh	untried.	——	French Furze, Curragh	——	6 sovs., h. b. 3 sovs.
Drumour	chesnut	6	by Big Jerry or Weatherbit, out of Elspeth, by I. Birdcatcher	started 10, won 2	won the July	untried.	——	Fairfield, York	Mr. Fowler	10 gs. (35 mares)
Elcot	bay	11	by Venison, out of a half-bred horse by Defence	started 7, won 3	won Woodcote Stakes	untried.	——	Woolaton, Nottingham	Mr. Harrison	5 gs., h. b. 2 gs.
El Hakim	bay	6	by The Cure, out of Martin Cat, by M. Moloch	started 13, won 3	won Ebor Handicap	untried.	——	Richmond, York	W. Metcalfe	5 gs.
Ellington	brown	7	by The Flying Dutchman, out of Ellerdale, by Lanercost	started 10, won 3	won the Derby	untried.	——	Willesden	Mr. Tilburn	10 gs.
Elvaston	bay	8	by Ithuriel, out of Sophistry, by Voltaire	never appeared	——	untried.	——	The Berkeley Kennels.	——	3 sovs.
Ethelbert	chesnut	10	by Faugh a-Ballagh, out of Espoir, by Liverpool	started 10, won 3	won City & Suburban H.	1	Dreadnought	Swallcliffe, Banbury	Mr. Gulliver	10 gs., h. b. 5 gs.
Event	chesnut	11	by The Cure, dam by Bobadil	started 18	——	untried.	——	The Sun, Ulverstone	Mr. T. Smith	5 gs., h. b. 2 gs.
Fallow Buck	bay	15	by Venison, out of Plenary, by Emilius	never appeared	——	11	Electric	Rawcliffe, York	T. Baitson	10 gs.
Fandango	bay	8	by Barnton, out of Castanette, by Don John	started 26, won 17	won the Ascot Cup	untried.	——	Middlethorpe, York	E. Hartley	12 gs. (40 mares)
Fazzoletto	bay	7	by Orlando, out of Canezou, by Melbourne	started 6, won 5	won 2,000 Gs. Stakes	untried.	——	Lane Paddocks, Sheffid.	Mr. F. Croft	15 gs. (30 mares)
Findon	brown	7	by Touchstone, out of Alice Hawthorne, by Muley Moloch	started 4, won 1	won £250 at Newmarket	untried.	——	Swiney, Haslemere	——	3 gs., h. b. 2 gs.
Fisherman	brown	7	by Heron, out of Main Brace, by Sheet Anchor	started 120, won 70	won 25 royal plates	untried.	——	Swallcliffe, Banbury	Mr. Gulliver	25 gs. (25 mares)
Flatcatcher	bay	15	by Touchstone, out of Decoy, by Filho-da-Puta	started 26, won 17	won 2,000 Gs. Stakes	50	Courtenay	Fairfield, York	Mr. Fowler	5 sovs., h. b. 2 sovs.
Frogmore	bay	5	by Touchstone, out of D. of Kent, by Belshazzar	never appeared	——	untried.	——	Brighton and Sussex	Mr. Megennis	5 sovs., h. b. £2 10s.
Fulbeck	bay	8	by Beverlac, out of Alfreda, by Elis	started 25, won 6	second for Goodwood S.	untried.	——	Eyton, Salop	Mr. Davenport	6 gs., h. b. 2½ gs.
Gameboy	brown	18	by Tomboy, out of Lady Moore Carew, by Tramp	never appeared	——	35	Trousseau	Manchester	Mr. Groves	
Gamekeeper	brown	9	by Birdcatcher, out of Swallow, by Lanercost	started 53, won 10	won Chester Handicap	untried.	——	Maryborough, Ireland	——	4 sovs., h. b. £2
Gemma di Vergy	brown	6	by Sir Hercules, out of Snowdrop, by Heron	started 33, won 18½	ran second for Ascot Cup	untried.	——	Theobald's, Stockwell	Messrs. Wetherby	20 gs. (25 mares)
Glenmasson	bay	6	by Cotherstone, out of Annette, by Priam	started 11, won 5	won Stwd's. Cp. Goodwood	untried.	——	Warden, Biggleswade	T. Morgan	7 sovs., h. b. 3 sovs.
Great Unknown,	brown	15	by Voltaire, out of The Princess, by Slane	never appeared	——		——	Combridge, Uttoxeter	Mr. Johnson	5 gs., h. b. 3 gs.
Grecian	chesnut	12	by Epirus, out of Jenny Jumps, by Rococo	started 4, won 2	won July Stakes	6	Abron	Rawcliffe, York	——	5 gs., h. b. 2 gs.
Grosvenor	brown	12	by Touchstone, out of Miss Beverley, by Stockport	started 3, won 1	won Plymouth Vase	1	Wilton	Aldford, Chester	——	7 gs., h. b. 3½ gs.
Hadji, The	bay	5	by Faugh-a-Ballagh, out of Athol Brose, by Orlando	started 8	ran second for St. Leger	untried.	——	Spofforth, Wetherby	Mr. Groves	
Happy Land, The	brown	5	by Jericho, out of Glee, by Touchstone	started 24, won 8	won the Criterion	untried.	——	Alvediston, Salisbury	——	10 gs.
Harry	brown	6	by Little Harry, out of Marchioness d'Eu, by Magpie	started 5	——	untried.	——	Eyefield, Newbridge	——	
Harry the Great	chesnut	8	by Epirus, out of Fraudulent, by Venison	never appeared	——	untried.	——	Warfield, Bracknell	Mr. E. Day	7 gs., h. b. 3½ gs.
Hermit, The	brown	9	by Bay Middleton, out of Jenny Lind, by Touchstone	started 10, won 5	won 2,000 Gs. Stakes	3	Amy Sedgwick	Fairfield, York	Mr. Fowler	5 sovs., h. b. 2 sovs.
Hesperus	bay	11	by Bay Middleton, out of Plenary, by Emilius	started 14, won 8	won Glasgow Stakes	5	Hesperethusa	Oakley, Bedford	J. Blanchet	10 sovs., h. b. 5 sovs.
Hobbie Noble	bay	11	by Pantaloon, out of Phryne, by Touchstone	started 14, won 5	won New Stakes	3	Merryman	Cawston, Rugby	W. Hemming	15 gs.
Hospodar	chesnut	9	by Hetman Platoff, out of Infidelity, by Voltaire	started 36, won 14	won £240 at York	untried.	——	Gillingwood, Richmond	W. Metcalfe	6 gs., h. b. 2 gs.
Hume (late Economy)	bay	4	by Flatcatcher, dam by Economist	never appeared	——	untried.	——	Brownslade, Pembroke	——	5 gs., h. b. 2 gs.
Huntingdon	black	6	by Hernandez, dam by Jeremy Diddler	started 33, won 10	won Lincoln Handicap	untried.	——	Lord Nelson, Boston	G. Young	5 gs., h. b. 2 gs.
Hunting Horn	brown	6	by Surplice, out of Ferina, by Venison	started 1	won Hunter Prize, Wrwk.	untried.	——	Shiffnal	Mr. Wadlow	
Hurworth	chesnut	10	by Birdcatcher, out of Wasp, by M. Moloch	never appeared	——	1	Laird of Prudhoe	Minten, Wem	Mr. Clay	7 sovs., h. b. 3 sovs.
Idas	bay	18	by Liverpool, out of Marpessa, by Muley	started 24, won 13	won 2,000 Gs. Stakes	3	Evington Lass	Silsden, Keighley	Mr. Fort	7 gs., h. b. 3 gs.

STALLIONS FOR THE SEASON 1860—(*Continued*).

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of winners out by.	Sire of	Standing at	Apply to	Price.
Idle Boy	chesnut	15	by Harkaway, out of Idle, by Sir Hercules....	started 9	——	8	Pretty Boy......	Rawcliffe, York	Mr. T. Baitson ..	15 gs. (40 mares
Ignoramus......	bay	6	by The Flying Dutchman, out of Ignorance, by The Little-known	started 19, won 12	won Prince of Wales' Stakes	untried.	——	Crome, Worcester	J. Hickling	10 sovs.
Jermak	bay	5	by The Cossack, out of the Era, by Camel ..	never appeared ..	——	untried.	——	Cynynion, Oswestry ...	Mr. Thomas. ..	6 gs., h. b. 3 gs.
Joe Lovell......	bay	19	by Velocipede, out of Cyprian, by Partizan....	started 33, won 23	won Newmarket S......	23	Hungerford	Boston	Mr. P. Smith....	——
Johnstown......	bay ...	12	byTearaway, out of Maid of Ardeigh, by Napoleon	started 3	——	untried.	——	Moyrath, Trim, Ireland	——	4 sovs., h. b. 2 sovs
Jordan	bay	5	by Jericho, out of Guaracha, by Sheet Anchor	started 11, won 1	won Liverpool Leger ..	untried.	——	Rawcliffe, York	T. Baitson......	5 gs.
King Caradoc ...	black ..	12	by Prince Caradoc, out of Miss Julia Bennett by Muley Moloch	started 14, won 2	won £144 at Malton....	untried.	——	Scarbro'	Mr. Stephenson .	gratis, h. b. 2 gs.
King of Trumps .	chesnut	11	by Velocipede, out of Mrs. Gill, by Viator	started 47, won 15	won the Port	untried.	——	Dringhouses, York	Mr. Horsley	5 gs.
Kingston	bay	11	by Venison, out of Queen Anne, by Slane ...	started 43, won 17½	won Goodwood Cup ...	11	Gladiolus.......	Middle Park, Eltham ..	Mr. Blenkiron ..	25 gs.
King Tom	bay	9	by Harkaway, out of Pocahontas, by Glencoe	started 6, won 3	ran second for Derby ..	2	Mainstone.	Mentmore, Bucks	Mr. Markham ..	30 gs.
Knight Templar.	chesnut	16	by Jack-in-the-Green, out of Babel, by Interpreter	never appeared ..	——	——	——	Sawston, Cambridge ..	Mr. Hockcliffe ..	5 sovs.
Knight of Khars	bay	5	by Nutwith, out of Pocahontas, by Glencoe ..	started 10, won 2	won Whitley Stakes....	untried.	——	Danebury, Stockbridge.	——	10 gs.
Koh-i-noor	chesnut	11	by The Libel, out of Miss Kitty Cockle, by Cadland	started 17, won 4	won Cheshire Stakes ...	untried.	——	Wolverhampton ..	Mr. Daly	6 gs., h. b. 3 gs
Lambton	bay	10	by The Cure, out of Elphine, by Emilius......	started 26, won 10½	won York County Plate..	——	——	Ownby, Brigg	Mr. J. Ashton ..	6 gs.
Lambourn	chesnut	6	by Loup-Garou, dam by Pantaloon	started 17, won 5	won the Molecomb	untried.	——	Warford, Knutsford ..	Mr. Makin......	8 gs., h. b. &c., 4gs
Lascelles........	bay	10	by Touchstone, out of Cara, by Belshazzar....	ran well in England	and the Crimea	untried.	——	Bridgwater............	Mr. Hopkins....	5 gs., h. b. 2½ gs.
Launcelot	brown ..	23	by Camel, out of Banter, by Master Henry....	started 10, won 6½	won St. Leger	24	Lance	Paddocks, Sheffield....	Mr. Croft	5 gs.
Leamington	brown ..	7	by Faugh-a-Ballagh, dam by Pantaloon......	started 25, won 7	won Chester Cup(2)....	untried.	——	Rawcliffe, York	T. Baitson......	20 gs. (30 mares)
Leopold	chesnut	11	by Phlegon, out of Marinella, by Soothsayer..	started 7, won 2	won Ascot Vase	1	Bastion	Ownby, Brigg........	Mr. J. Ashton ..	5 gs., h. b. 2 gs.
Lerrywhent	bay	11	by Lanercost, out of Titania, by Emilius	started 47, won 10	won a Royal Plate	untried.	——	Lancaster	——	
Longbow	bay ...	13	by Ithuriel, out of Miss Bowe, by Catton......	started 21, won 13	won Stewards' Cup	9	Toxophilite	Knowsley, Prescott .	T. Forshaw	15 gs.
Lord Falconberg.	bay	10	by Birdcatcher, out of Alice Hawthorne, by Muley Moloch	started 19, won 1	won a Royal Plate......	1	First Lord	Fairfield, York........	Mr. Fowler	10 gs. (40 mares)
Lord Albemarle.	bay	10	by the Emperor, out of Coral, by Sir Hercules	started 23, won 5	won 95 at Goodwood ..	untried.	——	Biddestone, Chippenham	W. Truelove ...	3 gs.
Lord of the Isles	bay	8	by Touchstone, out of Fair Helen, by Pantaloon	started 10, won 4	won 2,000 gs. Stakes ..	untried.	——	Swalcliffe, Banbury...	Mr. Gulliver....	12 gs., h. b. 6 gs.
Loup-Garou	brown ..	14	by Lanercost, out of Moonbeam, by Tomboy..	started 6, won 1	received £15 ft.	9	Lupullus	Cawston, Rugby......	Mr. W. Hemming	15 gs.
Loyola	black ..	6	by Surplice, out of Latitude, by Langar......	started 10, won 2	won the Clearwell	untried.	——	Aldsworth, Northleach..	Mr. Waine	10 gs., h. b. 2 gs.
Magnet	bay	18	by Camel, out of Queen of the Vale, by Tarrare	started 15, won 11	won Granby Handicap	1	Magnifier	Repository, Bath	Mr. Eve........	7 gs., h. b. 3 gs.
Magnifier	chesnut	6	by Magnet, out of Lady Paramount. by The Earl	started 4, won 1½	won £90 at Manchester..	untried.	——	Buckham, Uckfield....	Mr. T. Brown ...	10 gs.
Malcolm........	chesnut	17	by The Doctor, out of Myrrha, by Malek......	started 8, won 2	won Prince of Wales S.	28	Polly Johnson ..	Tupgill, Middleham ..	——	
Marley Hill	brown ..	9	by Melbourne, out of Mowerina, by Touchstone	started 4, won 1	won Newcastle Derby ..	untried.	——	Skerne, Driffield	Mr. Stockdale ..	5 gs., h. b. 2 gs.
Marsyas........	chesnut	9	by Orlando, out of Malibran, by Whisker	started 7, won 3	won July Stakes	untried.	——	Middle Park, Eltham..	Mr. Blenkiron ..	10 gs., h. b. 5 gs.
Mayor of Hull..	chesnut	10	by Shawn Buidhe, out of Zulima, by Philip ..	started 1, won..	——	untried.	——	Theobald's, Enfield....	Mr. A. Gray....	10 gs., h. b. 5 gs.
Mathematician..	bay	14	by Emilius, out of Maria, by Whisker........	started 10, won 5	won Ebor Handicap....	3	Monge..........	Redlands, Reading ..	J. Dibben	10 gs.
M. D............	brown ..	6	by The Cure, out of Theano, by Waverley	started 11, won 3	won the Nursery	untried.	——	Mountainstown, Meath	——	6 sov., h. b. 3 sov.
Midas	chesnut	12	by Beiram, out of Merope, by Voltaire	started 25, won 9	won Newmarket St. Leger	2	Pactolus........	Burghley, Stamford ..	Mr. H. Rose	15 gs.
Mildew	chesnut	13	by Slane, out of Semiseria, by Voltaire	started 21, won 10	won Ascot Vase	7	High Treason...	Defford, Pershore	Mr. J. Robertson	12 gs.
Mohamed Mirza Hamid Allee	bay		an Arabian, imported in 1856		——	untried.	——	Newmarket	Messrs. Barrow..	5 gs., h. b., 3 gs. (30 mares)
Monarque	bay	9	by The Baron, Sting, or the Emperor, out of Poetess, by Royal Oak	ran in England & France, won 23	won Goodwood Cup....	untried.	——	Dangu, Gisors, France..	——	20 sovs.
Morpeth	brown ..	19	by Muley Moloch, dam by Cervantes	started 33, won 21	won Northampton Stakes	——	——	Carnaby	——	

Mountain Deer	bay	12	by Touchstone, out of Mountain Sylph, by Belshazzar	started 20, won 6	won the Criterion	10	Twilight	Dean's, Hill, Stafford	Mr. Painter	15 gs. (40 mares)
Mr. Milner	brown	14	by Bay Middleton, out of Miss Milner, by Malek	started 2, won 1	won Molecomb Stakes	—	—	Newmarket	—	7 gs., h. b. 3 gs.
Muscovite	bay	11	by Hetman Platoff, dam by Camel	started 10, won 2	won Cesarewitch	untried.	—	Newmarket	Mr. Butler	10 gs.
Nabob	black	11	by The Nob, out of Hester, by Camel	started 26, won 6	won Chesterfield Cup	2	Nutbourne	Chevilly, Paris	Messrs. Wethrby	20 sovs. (40 mares)
Neasham	bay	12	by Hetman Platoff, out of Wasp, by Muley Moloch	started 10, won 3	won Northumberland P.	2	Heroine	Easby, Richmond	Mr Massie	8 gs.
Neville	bay	9	by Napier, out of Sally Snobs, by Sandbeck	started 16, won 7	won Gt. Northern Hand.	untried.	—	Richmond, Yorkshire	W. Metcalfe	5 gs., h. b. 2 gs.
Newcourt	bay	17	by Sir Hercules, out of Sylph, by Spectre	started 19, won 8	won Hereford Stakes	10	Vigo	Flemings, Wickford	—	20 gs.
Newminster	bay	12	by Touchstone, out of Beeswing, by Dr. Syntax.	started 10, won 2	won St. Leger	25	Musjid	Rawcliffe, York	Mr. Baitson	subs. *full*
Newton-le-Willows	brown	6	by Melbourne, out of Lapwing, by Bustard	started 19, won 8	won Kirwan Handicap	untried.	—	Limerick	—	3 sovs., 2 sovs.
Nutwith	bay	20	by Tomboy, dam by Comus	started 7, won 3	won St. Leger	33	Cobnut	Burghley, Stamford	Mr. H. Rose	15 gs.
Omar Pasha	bay	—	an Arabian—a pure Seglavée Djederanee	never appeared		untried.	—	Althorp, Northampton	Mr. Wilson	2 gs.
Old Tom	bay	6	by Melbourne, out of Lady Shrewsbury, by Launcelot	started 38, won 8	won £120 at Newmarket	untried.	—	Hednesford	—	2 gs.
O Rest	bay	3	by Orestes, out of Lady Louisa, by Touchstone	never appeared	—	untried.	—	Kettleby Thorp, Brigg	T. Bates	3 gs.
Orleans	bay	4	by Orlando, out of Ma Mie, by Jerry	started 12	—	1	—	Ossington, Newark	—	
Oulston	bay	8	by Melbourne, out of Alice Hawthorn, by Muley Moloch	started 11, won 7	won Queen's Vase	untried.	—	Cawston, Rugby	Mr. Hemming	10 gs., h. b. 5 gs.
Paletot	brown	8	by Touchstone, out of Canezou, by Melbourne	started 13, won 4	won £1300 at Newmarket	untried.	—	Knowsley, Prescott	T. Forshaw	7 gs., h. b. 3½ gs.
Paymaster	brown	21	by Muley Moloch, dam by Brutandorf	never appeared	—	1	Wellington	Cawston, Rugby	W. Hemming	2 sovs.
Pelion	brown	10	by Ion, out of Ma Mie, by Jerry	started 16, won 8	won Eglinton Stakes	4	Castanette	Danebury, Stockbridge.	—	10 gs.
Phlegon	bay	20	by Beiram, out of Lucetta, by Reveller	started 6, won 2	won G Duke Michael S.	13	Leopold	Burghley, Stamford	Mr. H. Rose	10 gs.
Pompey	bay	13	by Pompey, out of Interlude, by Physician	started 26, won 1	won £350	untried.	—	Louth, Ardee, Ireland	C. Campbell	£1 10s.
Pottinger	bay	16	by Plenipotentiary, out of Enterprise, by Defence	started 22, won 5	won £80 at Newmarket	—	—	Howden, &c.	Mr. Sanderson	5 gs., h. b. 2 gs.
Poynton	bay	17	by Touchstone, out of Lady Stafford, by Comus	started 6, won 2	won Great York S.	11	Lady Vernon	Manchester &c.	Mr. Hardbron	6 gs., h. b. 3 gs.
Prime Minister	brown	12	by Melbourne, out of Pantalonade, by Pantaloon	started 31, won 8	won the Port	5	Lustre	Childwick, St. Albans	Mr. Mather	10 gs., h. b. 5 gs.
Ralpho	bay	4	by Barnton, dam by Melbourne	started 2, won 1	won Match at Newmarket	untried.	—	Eaton, Chester	—	5 sovs.
Ratan	chesnut	19	by Buzzard, dam by Picton	started 7, won 3	won the Criterion	14	Penang	Alvediston, Wilts	—	10 gs.
Rataplan	chesnut	10	by The Baron, out of Pocahontas, by Glencoe	started 71, won 42	won 21 Royal Plates	1	Plumper	Tickhill Castle Farm	W. Hornshaw	25 gs. (40 mares)
Rattle	chesnut	10	by The Fallow Buck, out of The Hamble, by Camel	started 7	—	untried.	—	Audler's Ash. Liss.	Mr. Ayling	8 gs.
Retriever	chesnut	24	by Recovery, out of Taglioni, by Whisker	started 53, won 24	won Goodwood Stakes	11	Remunerator	Water Tower, Rugby	Walker & Watson	5 gs., h. b. 2½ gs.
Reynaldo	bay	4	by Kingston, out of Kirtle, by Sultan	started 3	—	—	—	Churchend, Willesden	Mr. Peat	5 gs., h. b. 3 gs.
Roebuck	brown	4	by Mountain Deer, out of Marchioness D'Eu, by Magpie	started 2	—	untried.	—	Balintubber, Ireland	—	4 sovs., 2 sovs.
Ruby	bay	9	by Bay Middleton, out of Crown Jewel, by Dulcimer or Coronation	started 9, won 1	won Althorp Park S.	untried.	—	High Wycombe	Mr. T. Robinson	5 gs., h. b. 2½ gs.
Sampson	black	5	by Goliah, out of Lady Sarah, by Velocipede	started 11, won 3	won £100	untried.	—	Church End, Willesden	Mr. Peat	5 gs., h. b. 3 gs.
Saucy Boy	chesnut	—	by Arthur, dam by Mameluke	a steeplechase horse	won Caen Steeple-chase	untried.	—	Willesden	Mr. Tilburn	13 gs.
Saunterer	black	6	by Irish Birdcatcher, out of Ennui, by Bay Middleton	started 54, won 26	won Goodwood Cup	untried.	—	Croft, Darlington	Mr. Winteringhm	15 gs. (30 mares)
Schuloff	bay	4	by The Cossack, out of Mabella, by Melbourne	started 2, won 1	won Tyro Stakes	untried.	—	Montbarron, Ulverston	Mr. T. Smith	10 gs.
Selim Pacha	bay	11	An Arab of the High Nedji Caste	never beat at Bmbay	—		—	Flixton, Bungay	J. Mitchell	10 gs., h. b. 5 gs.
Skirmisher	bay	6	by Voltigeur, dam by Gardham	started 23, won 8	won Ascot Cup	untried.	—	Rufford, Ollerton	Messrs. Wetahrby	12 gs. (30 mares
St. George	bay	19	by Ishmael, out of Whim, by Drone	ran well in Ireland	—	1	Knight of Avon	Holcombe, Somerset	W. Langworthy	£2 10s.
St. Lawrence	brown	23	by Skylark or Lapwing, out of Helen, by Blacklock	started 58, won 28	won the Chester Cup	14	Saucebox	Market Harboro'	Mr. Burdett	7 gs., h. b. 3 gs
Sir John Barleycorn	brown	11	by The Baron, out of Loveslip, by Camel	started 4	—	untried.	—	Skirmet, Henley-on-Thames	Mr. Hussey	2½ gs.
Sir Peter Laurie	bay	16	by The Saddler, out of Well-a-day, by Priam	winner of many	steeplechases	untried.	—	Cheltenham	Mr. Holman	5 gs. (45 mares

STALLIONS FOR THE SEASON, 1860—(*Continued*).

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of Winners out by	Sire of	Standing at	Apply to	Price.
Sir Tatton Sykes	bay	17	by Melbourne, dam by Margrave	started 12, won 4	won St. Leger	15	Mr. Sykes	Stanton, Shiffnall	Mr. Eyke	7 gs.
Snowden Dunhill	bay	10	by Iago, out of Daughter of Toscar, by Bay Middleton	started 47, won 13	won Chesterfield Handicp	2	Knayton	Bonehill, Tamworth	Mr. W. Robinson	10 gs.
Solferino (late Snowden)	brown	—	by Melbourne, out of Pandora, by Cadland or Cain	—	—	—	—	Bonehill, Tamworth	Mr. W. Robinson	5 gs., h. b. 2 gs.
Spanish Jack	brown	17	by Don John, out of Miss Lydia, by Walton	started 3, won 1	won £70 at Newton	2	Donna	Clay Hill, Kent	Mr. Schillio	6 gs., h. b. 3 gs.
Stockwell	chesnut	11	by The Baron, out of Pocahontas, by Glencoe.	started 21, won 12	won St. Leger	14	Thunderbolt	Kirkby, Tadcaster	Mr. Scott	30 gs. (30 mares)
Storm	bay	12	by Touchstone, out of Ghuznee, by Pantaloon	started 2, won 1	won £460 at Doncaster	9	Stormsail	Redlands, Reading	Mr. Lediard	10 gs.
Sultan	chesnut	8	by Crescent, out of Madame Vestris, by Distingué	started 11, won 6	won Cambridgeshire	untried.	—	Slane Castle, Ireland	—	5 gs.
Surplice	brown	18	by Touchstone, out of Crucifix, by Priam	started 16, won 9	won the Derby	36	Roman Candle	Danebury, Stockbridge	Messrs. Wetherby	15 gs. (40 mares)
Swale	bay	5	by Malcolm, out of the Roper's Daughter, by Tomboy	started 11, won 1	won £39 at Wenlock	untried.	—	Tupgill, Middleham	—	
Sweetmeat	brown	18	by Gladiator, out of Lollypop, by Starch	started 24, won 22½	won Queen's Vase	41	Mincemeat	Stanton, Shiffnall	Mr. Eyke	15 gs. (20 mares)
Tadmor	brown	14	by Ion, out of Palmyra, by Sultan	started 11, won 8	won Gratwicke Stakes	15	Leontes	Roydon, Diss	G. Sturgeon	15 gs.
Teddington	chesnut	12	by Orlando, out of Miss Twickenham, by St. Giles	started 18, won 10	won the Derby	20	Mayonaise	Theobald's, Enfield	Mr. A. Gray	30 sovs. (31 mares)
Tempest	brown	7	by Melbourne, out of Meanee, by Touchstone	never appeared	—	untried.	—	Newton Purcell, Oxon.	Mr. Crawford	5 gs., h. b. 2½ gs.
Theon	brown	18	by Emilius, out of Maria, by Whisker	started 6, won 3	won Doncaster Two-yr. S.	17	Alcoran	Boston	Mr. P. Snaith	3 gs.
Touchwood	bay	4	by Touchstone, out of Bonnie Bee, by Galanthus	never appeared	—	untried.	—	Childwick, St. Albans	Mr. Mather	5 gs., h. b. 2½ gs.
Touchstone	brown	29	by Camel, out of Banter, by Master Henry	started 21, won 16	won St. Leger	175	Surplice	Eaton, Chester	—	30 gs. (12 mares)
Toxopholite	bay	5	by Longbow, out of Legerdemain, by Pantaloon	started 18, won 11	2nd for the Derby	untried.	—	Doncaster	Mr. Cunningham	10 sovs. (20 mares)
Trapper, The	bay	9	by Ion, out of Prairie Bird, by Gladiator	started 6, won 5	won Duke Michael S.	untried.	—	Theobald's, Enfield	Mr. Gray	10 gs.
Turk, The	bay	7	by Melbourne, out of Agnes, by Pantaloon	started 13, won 3	won a Cup at Chelmsford	untried.	—	Ardee, Louth, Ireland.	C. Campbell	4 sovs, h. b. 2 sovs
Turnus	bay	14	by Taurus, out of Clarissa, by Defence	started 5, won 3	won Chesterfield Cup	12	Hamlet	Winkfield, Berks	—	10 gs.
Vandermulin	brown	7	by Van Tromp, out of Miss Julia Bennett, by Muley Moloch	started 20, won 3	won Warwickshire H.	untried.	—	Willesden	Mr. Tilburn	10 gs., h. b. 5 gs.
Vedette	brown	6	by Voltigeur, dam by Birdcatcher	started 10, won 8	won 2,000 gs. Stakes	untried.	—	Roydon, Diss	G. Sturgeon	20 gs.
Vengeance	bay	8	by Chanticleer, dam by The Saddler	started 21, won 7	won Cesarewitch	untried.	—	Hurstbourne, Hants	Mr. Milton	10 gs., &c.
Vindex	bay	10	by Touchstone, out of Garland, by Langar	started 40, won 13	won Champagne S.	untried.	—	Fairfield, York	Mr. Fowler	12 gs.
Voltigeur	brown	13	by Voltaire, out of Martha Lynn, by Mulatto	started 11, won 5	won the Derby	25	Vedette	Hampton Court	—	40 gs. (*full*)
Warlock	roan	7	by Birdcatcher, out of Elphine, by Emilius	started 19, won 6	won St. Leger	untried.	—	Kirby, Tadcaster	Mr. Scott	10 gs.
Weatherbit	brown	18	by Sheet Anchor, out of Miss Letty, by Priam	started 8, won 3	won Four-year-old S.	35	Beadsman	Easby, Richmond	Mr. Massey	20 gs. (30 mares)
West Australian	bay	10	by Melbourne, out of Mowerina, by Touchstone	started 11, won 10	won the Derby	16	Summerside	Kirkby, Tadcaster	Mr. Scott	30 gs. (30 mares)
Wild Dayrell	brown	8	by Ion, out of Ellen Middleton, by Bay Middleton	started 4, won 3	won the Derby	3	Buccaneer	Chilton, Hungerford	Mr. Rickaby	30 gs. (40 mrs.) *full*
Windhound	brown	13	by Pantaloon, out of Phryne, by Touchstone	started 6, won 1	won £74 at Reading	12	Thormanby	Spofforth, Wetherby.	Mr. Groves	
Windischgratz	bay	12	by Jeremy Diddler, out of Medea, by Whisker	started 13, won 2	won Goodwood Stakes	2	Inniskillen	Castle Archdall, Enniskillen	H. Heppenstall	5 gs., h. b. 2 gs.
Woolwich	chesnut	13	by Chatham, out of Clementina by Actæon	started 48, won 18	won Ascot Cup	11	Greenwich Fair	Rawcliffe, York	T. Baitson	5 gs., h. b. 2 gs.
Wrangler, The	bay	3	by Touchstone, out of Maria, by Harkaway	never appeared	—	untried.	—	Bozeal, Wellingboro'	Bradshaw	5 gs., h. b. 2 gs.
Yellow Jack	chesnut	7	by Birdcatcher, out of Jamaica, by Liverpool	started 7, won 1	ran second 6 times	untried.	—	Newmarket	Messrs. Barrow	11 gs., h. b. 5½ gs.
Young Melbourne	bay	5	by Melbourne, out of Clarissa, by Pantaloon	started 1	—	untried.	—	Doncaster	Mr. Cunningham	15 sovs. (20 mares)
Zingaro	bay	4	by The Fallow Buck, dam by Voltaire	never appeared	—	untried.	—	Dorney, Windsor	—	20 gs.

The Groom's Fee, if not included, varies from a Guinea to Half-a-Crown. We are not answerable for all the Performances of, or Stock out by, Irish Horses.

REVIEW OF THE CORN TRADE

DURING THE PAST MONTH.

The month of March has passed with but few indications of spring. It commenced with rain, which was followed by frosty nights and occasional snow, and though much wind has prevailed, wet still swamps many of the heavy lands. The few fine days experienced rapidly showed their beneficial effects on the wheat plant, which has recommenced its growth favourably on the fine high, well-cultivated land; but it shows the reverse in several localities, with many thin rows, and all the plants weak and small; still, should genial weather set in, these may greatly recover. The few roots that escaped the frosts have been nearly used up, and, with the grass only just beginning to grow, it has become difficult to provide for stock. The winds, though mixed with rain, have done much good to the samples newly thrashed, and there has been a general improvement in the condition. This circumstance, with light home supplies, and a still greater falling off in foreign, as well as firmer rates abroad, have recently brought about a more cheerful state of trade, with an advance of about 3s. per qr. on the currency of the previous month. The last averages, which are always about a fortnight behind the real business transacted, being 45s. 2d., only show a rise since last December of 1s. 8d. per qr.; but should the recent advance be permanent they are likely to reach 47s., which would bring us to the rates of last July: and as stocks keep reducing, and will be in firmer hands, the deficiencies of last year will begin to be felt, and very likely lead to a farther advance. This seems of late to have become the impression so generally, that a speculative spirit has reappeared in the trade, and large transactions have taken place for spring delivery in the Baltic. It indeed cannot be overlooked that less wheat has been sown than usual, partly from the autumnal heavy rains, and partly from its being so unremunerating.

The sowing of spring corn has been much impeded, but a few dry days will probably make up for lost time, and as there is plenty of moisture in the soil, there may be nothing lost on this score by lateness. The wheat plant on the Continent is variously reported. In some parts of Germany there have been complaints in consequence of the severity of the season; but in Southern Europe, say Portugal, Spain, and Italy, the appearances are considered favourable. As a whole there seems no cause for apprehension; though, as a better means for providing for the shortness of last season, the Pontifical Government has recently decreed the permission of foreign imports free of duty, and Naples has extended the permission till May Should politics drift into war, there would probably be a much higher range of prices, stocks everywhere being small, compared with the average of years, so that the safe ingathering of the next harvest is of the highest importance. The French markets have lately fluctuated, but after a transient calm have again been moving upwards, so that liberal imports from France are exceedingly improbable. Belgium and Holland are as dear as ourselves. The Baltic ports seem not likely to be open till the end of April, and scarcely leave any margin for profitable export. Odessa prices are comparatively high; and America, instead of giving way on the prospect of a re-opening, steadily advances her quotations for breadstuffs; and the last accounts sent from this country will give more or less excitement to every foreign shipping port, as well as produce higher demands. The following quotations have been recently current in the several places noted: Choice wheat at Paris was worth 52s., the lower qualities 46s. to 47s. 6d. per qr.; fine Baltic wheat at Antwerp was 53s. 6d. per qr.; at Termonde the top price was 50s.; at Louvain 64lb. red wheat was worth 51s. to 52s. per qr. Fine wheat at Danzig, which a little while ago was procurable at 48s., has been subsequently held at 52s. per qr., free on board; at Stettin the best red was 48s. to 49s.; Berlin and Konigsberg quoted a similar price. Sales of fine red Danish wheat have been made at 51s. per qr., cost, freight, and insurance included. At Hambro' red Upland 62lb. wheat was worth 50s. 6d. per qr. At Odessa wheat had sold at 36s. to 43s. per qr. Galatz quotations for soft of best quality were 36s. per qr. In Spain the markets remained irregular in consequence of the difficulty of transit. At Santander wheat was neglected. At Arevalo it was only quoted at 40s.; while at Seville the best hard was as high as 70s. per qr. New York quoted 43s. 4d. for Chicago spring, 50s. for white Kentucky, 53s. 4d. for white Indiana per 480 lbs.

The first Monday in London commenced on very moderate English supplies, and only one small parcel of foreign. The morning's show of samples from the near counties was also small, and the condition being somewhat improved sales of all dry qualities were more freely made, at fully the previous quotations, but all lots out of condition were still difficult to dispose of. The foreign trade, uninfluenced by the small supply, remained very slow and retail. The country advices were all of a similar character, showing an increased firmness even where the supplies were good, and some, as Boston, were rather higher. Both Tuesday and Friday's markets at Liverpool were thin, and prices steady. The Scotch and Irish markets were much the same.

The second Monday was better supplied with native wheat, and again there was scarcely any from the continent. The morning's supply from Kent and Essex was again deficient, and the winds prevailing having much improved the condition, sales were occasionally made at 1s. per qr. advance, but rough parcels were still dull, and the foreign business was without change. This week the country advices rather varied: some places were dull, as Newbury and Gloucester; some only slightly better, as Louth and Sheffield; more generally, as at Hull, Boston, Newark, and Bristol, there was an advance of 1s. per qr.: while Stockton-on-Tees and Birmingham reported an improvement of 1s. to 2s. per qr. Tuesday at Liverpool was without change, but on Friday red wheat was 1d. to 2d. per cental dearer. At Glasgow wheat was held for an advance of 6d. to 9d. per boll, but Ireland generally was only firm.

The third Monday had a better native supply as well as foreign, though the latter was very insignificant. From the near counties there was a better show of samples in the course of the morning, the condition remaining improved, though there had been rain in the previous week. Factors again demanded an advance of 1s. to 2s. per qr., but there was less demand in their favour than on the former Monday, and it was with extreme difficulty that any improvement was realized on picked parcels, the ordinary sorts being dull. For some sorts of foreign more money was demanded, and occasionally paid, but the business was but retail. The country markets were, however, more on the move than previously: Hull, Leeds, Wakefield, Newark, Gainsborough, with many more, were up fully 1s. per qr; Alford, Boston, Louth, Lynn, Norwich, and some other places, were 1s. to 2s. per qr. dearer, and the advance reported at Leicester was 2s. to 3s. per qr. Liverpool experienced a very active demand on Tuesday for red wheat, at 2d. to 3d. per cental advance, and another penny was gained on Friday. London also closed on Friday with an improvement of 1s. per qr. both on English and foreign sorts. The Scotch markets were less animated, as well as those of Ireland.

The fourth Monday was again lightly supplied from abroad, as well as by coast and rail. Essex and Kent sent up but a poor show during the morning, and this market was the liveliest of the four, with a decided advance early in the morning of 1s. per qr. where sellers were anxious to place, and subsequently of 2s., but more slowly, even the lower descriptions participating in the upward movement. There was also more doing in foreign, some holders requiring an improvement of 3s. per qr., but we did not hear of 2s. per qr. being exceeded, and that was only made occasionally. The country markets this week generally advanced 2s. per qr., and some few as much as 3s. per qr.

The imports into London for the four weeks have been 28,361 qrs. English, 5,590 qrs. foreign only, against 22,786 qrs. English, 27,125 qrs. foreign during the same time last year. There were no exports this month. The total imports into the United Kingdom during the month of February were 53,087 qrs. wheat, 125,262 cwts. flour.

The supplies of country flour during the month have been fair, and very equal. Scarcely any French sacks have been received, but in American barrels there have been fair arrivals, and some of good quality. The best supply of American coming on at the beginning of the month, some holders accepted prices below the previous quotations, good qualities being sold at 26s. per brl., but on the fourth Monday there was a decided improvement, sales having been made at 28s. per brl., and Norfolks, which at the beginning of March were between 30s. and 31s. per sack, were held at 33s. 6d. Contrary to the general expectation, millers made no change in the price of their best flour, which therefore remained 43s. per sack, as on the first Monday. The imports into London during the four weeks have been 74,339 sacks country flour, 304 sacks 11,109 brls. foreign, against 60,532 sacks country, 5,284 sacks 2,293 brls. foreign, in March 1859. The only exports were 175 cwts. flour.

Though there was nearly double as much British barley as last year, the foreign supplies little exceeded one-half of what they were in March 1859. Throughout the month the trade has been very steady, the scarcity of malting qualities keeping up a high range of prices both for the little English appearing as well as Scotch and Saale qualities. Grinding sorts have also found a better sale, and after remaining firm for three weeks, all descriptions gained 1s. in value on the fourth Monday. Large purchases in the Danube and Black Sea of grinding sorts have been made for Spring delivery; but the shortness of keep and backwardness of vegetation seem likely to make these supplies very welcome to consumers, at fair prices; but as the close of the season draws on, those who can get high prices for malting sorts, we think, had better not pass their opportunity, more especially as malt is dull, and throughout the month has not improved in value. The arrivals in London during the four first weeks of March were 17,886 qrs. British barley, 25,412 qrs. foreign, against 8,953 qrs. British, 40,471 qrs. foreign, in March 1859.

There has been an extraordinary deficiency in the oat supply, and a still more extraordinary inactivity in the trade, which throughout the month has only been subject to such minute fluctuations as to be out of quotation range. The fact is, granary stores have been the almost only feeders of the market, and as these were mostly gathered last autumn (September alone showing the foreign arrivals as 250,600 qrs.) it has been quite a turn for those who then, for want of buyers, were compelled to land their heavy Russian cargoes. A long absence of ship samples was almost necessary for their benefit, and these short arrivals have been very opportune. As the granaries are, however, now getting thinned, unless ship supplies come very abundantly, we may see an improvement on their appearance. The imports into London during the four weeks were 13,455qrs. English, 653 qrs. Scotch, 4,900 qrs. Irish, and 25,328 qrs. foreign, against 3,533 qrs. English, 9,953 qrs. Scotch, 10,875 qrs. Irish, and 34,267 qrs. foreign, this time last year.

Of beans during the month the supply has been better than of any other grain, both in home-growth and foreign. It is not, therefore, to be wondered at that some markets have been heavy, especially in new English not in fine condition; but prices, as a whole, have remained steady and unvaried, though some quantity of lentils has been imported in addition. The arrivals for the four weeks in native sorts were 5,582 qrs., in foreign

5,532 qrs., against 2,869 qrs. English, 2,978 qrs. foreign, in 1859; so that the present supply has been nearly double what it was then.

No foreign peas whatever have been received during the month, and the English supply has only been moderate. The demand, however, of those for hog-feed has been checked by the lower price of grinding barley, and there has been very little inquiry for boilers. Still the shortness of the arrivals generally, as well as the small stock of foreign boilers, have rather improved the value of all sorts, and should any large contracts come out, there would be difficulty to meet them, and prices must advance for white.

Linseed has been in moderate supply during the month, and all through there has been a steady export demand. There has been great firmness in the trade, and a further improvement of about 1s. per qr., notwithstanding the high range of prices. Cakes have continued to sell well at full rates, their nutritive qualities being more and more appreciated, especially at a time when keep has been short.

The seed trade has had to contend with the difficulties of an extremely backward season, which making holders anxious, has lowered prices and lessened trade. Red cloverseed has, therefore, rather given way, and the same high prices cannot be obtained for white as of late. Trefoil has also ruled dull and cheaper, and the same state of trade has obtained in France. Tares have also been less in demand, small being worth about 45s., and large have been selling at 56s. per qr.; but rapeseed and fine white mustardseed have ruled firm. Carraway, coriander, and other seeds have sold on hardly such good terms.

CURRENCY PER IMPERIAL MEASURE.

Shillings per Quarter.
WHEAT, Essex and Kent, white, new 41 to 53 ....old 42 to 54
,, ,, red new 39 50 ....old 41 51
Norfolk, Linc., and Yorks., red.................. 39 50
BARLEY, malting, new 30 to 37 .... Chevalier, new.. 39 45
Grinding .... 26 27 .... Distilling 29 31
MALT, Essex, Norfolk, and Suffolk ... 49 to 57 .. fine 60 70
Kingston, Ware, and town made .. 49 57 .. ,, 60 70
Brown .... 48 49 .. — —
RYE ....new — — .. 30 31
OATS, English, feed ... 20 to 25 ...... Potato 26 30
Scotch, feed......... 21 26 ...... Potato 26 30
Irish, feed, white .... 20 to 23 .. fine 24 28
Ditto, black .... 20 23 .. ,, — 25
BEANS, Mazagan........ 32 to 37 .... Ticks 34 36
Harrow............... 34 42 .... Pigeon 45 48
PEAS, new, white, boilers 36 40 Maple 37 to 38 Grey 33 34
FLOUR, per sack of 280 lb., Town, Households 38s., fine 41 43
Country .... 33 to 34 .... Households .. 34 38
Norfolk and Suffolk, ex-ship 32 33

FOREIGN GRAIN.

Shillings per Quarter.
WHEAT, Dantzic, mixed 52 to — high do. — to 54 extra — to 57
Konigsberg .... 50 53 ,, — — — —
Rostock .... 53 — fine 56 old 56 — —
American, white .. 45 51 red.... 44 to 49 — —
Pomera., Meckbg., & Uckermrk, red 49 51 — —
Silesian, red ...... 44 49 white......... 48 52
Danish and Holstein 48 50
Russian, hard 46 to 48 .. French 42 to 49 .. white 46 50
St. Petersburg and Riga 44 49
Rhine and Belgium.................................... 46 52
BARLEY, grinding............ 25 to 28 .. Distilling.. 29 31
OATS, Dutch, brew, & Polands 22 27 .. Feed 19 23
Danish and Swedish, feed .. 21 24 .. Stralsund. 21 25
Russian 19 23
BEANS, Friesland and Holstein 34 38
Konigsberg............... 32 to 36 .. Egyptian 33 35
PEAS, feeding .... 35 36 .. fine boilers.. 37 40
INDIAN CORN, white ...... 31 34 .. yellow 30 33
FLOUR, per sack.... French 31 38 .. Spanish, none — —
American, per brl., sour.. 24 25 .. sweet 26 28

IMPERIAL AVERAGES.

For the last Six Weeks:	Wheat. s.	Wheat. d.	Barley. s.	Barley. d.	Oats. s.	Oats. d.	Rye. s.	Rye. d.	Beans. s.	Beans. d.	Peas. s.	Peas. d.
Feb. 11, 1860	43	6	34	11	21	11	29	9	38	4	36	0
Feb. 18, 1860	43	11	34	11	21	11	31	10	38	6	36	3
Feb. 25, 1860	44	5	35	7	22	7	35	3	38	11	36	11
March 3, 1860	44	9	36	6	22	11	32	0	39	1	37	8
March 10, 1860	45	0	36	3	22	9	30	5	39	6	37	3
March 17, 1860	45	2	36	5	23	1	34	10	39	7	37	7
Aggregate average .	44	5	35	9	22	6	32	4	39	0	36	11
Same time last year	40	6	34	0	23	0	32	0	41	11	41	2

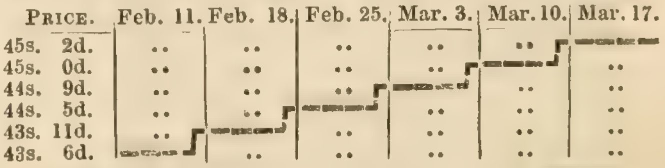
COMPARATIVE AVERAGES—1860-59.

From last Friday's *Gaz.*		s.	d.	From *Gazette* of 1859.		s.	d.
Wheat......	111,000 qrs.	45	2	Wheat......	92,278 qrs.	40	1
Barley......	44,329 ..	36	5	Barley......	54,579 ..	34	4
Oats.........	13,374 ..	23	1	Oats.........	12,314 ..	23	9
Rye	63 ..	34	10	Rye	84 ..	30	4
Beans	6,236 ..	39	7	Beans	3,599 ..	41	3
Peas.........	1,300 ..	37	7	Peas.........	669 ..	40	4

LONDON AVERAGES.

		£	s.	d.			£	s.	d.
Wheat	4,497 qrs.	£2	8	0	Rye.........	45 qrs.	£1	10	8
Barley	2,073 ..	1	16	10	Beans......	472 ..	1	17	4
Oats	474 ..	1	4	4	Peas	57 ..	1	16	9

FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT.



MONTHLY RETURN.

AN ACCOUNT SHEWING THE QUANTITIES OF CORN GRAIN, MEAL, AND FLOUR, IMPORTED INTO THE UNITED KINGDOM, AND ADMITTED TO HOME CONSUMPTION, IN THE MONTH OF FEBRUARY, 1860.

Species of Corn, Grain, Meal, and Flour.	Imported from foreign Countries.			Imported from British Possessions out of Europe			Total.		
	qrs.	bush.		qrs.	bush.		qrs.	bush.	
Wheat	53087	2		—			53087	2	
Barley	113210	0		—			113210	0	
Oats	30598	4		6	4		30605	0	
Rye	2619	3		—			2619	3	
Peas	5312	3		35	2		5347	5	
Beans	18425	1		—			18425	1	
Maize or Indian Corn ..	38692	6		800	0		39492	6	
Buck Wheat	6266	5		—			6266	5	
Bere or Bigg	—			—			—		
Total of Corn and Grain	268212	0		841	6		269053	6	
	cwts.	qr.	lb.	cwts.	qr.	lb.	cwts.	qr.	lb.
Wheat Meal and Flour.	124988	0	8	274	2	6	125262	2	18
Barley Meal	—			—			—		
Oat Meal	123	0	0	—			123	0	0
Rye Meal..............	5	0	0	—			5	0	0
Pea Meal..............	0	0	14	—			0	0	14
Bean Meal	—			—			—		
Indian Meal	183	1	16	—			183	1	16
Buck Wheat Meal......	12	1	22	—			12	1	22
Total of Meal and Flour.	125312	0	4	274	2	6	125586	2	10

PRICES OF SEEDS.

LONDON, MONDAY, March 26.—There is no noticeable improvement in the trade for Cloverseed: the market continues depressed, sales are slow, at the reduced rates for red seed of all varieties; white is a slower sale, without change. Trefoils are a slow sale at the reduction noted last week. Canaryseed without change. CUTLER & BARKER, Seed Factors.

BRITISH SEEDS.

MUSTARDSEED, per bush., new 10s. to 14s. brown 12s. to 16s.
CORIANDER, per cwt. .... 14s. 16s.
CANARY, per qr.................................. 50s. 54s.
TREFOIL, new..................................... 20s. 23s.
TARES, winter, new, per bushel .... 0s. to 0s. 0d.
LINSEED, per qr., sowing —s. to 60s. crushing.. 54s. to 58s.
LINSEED CAKES, per ton................ £9 10s. to £10 10s.
RAPESEED, per qr,.............................. 62s. to 66s.
RAPE CAKE, per ton .... £5 10s. to £6 0s.

FOREIGN SEEDS, &c.

Cloverseed, red 42s. to 56s. .... white	86s. to	94s.
Trefoil	20s.	23s.
Hempseed, small, —s. per qr. .... Dutch	—s.	40s.
Coriander, per cwt.	16s.	18s.
Carraway ,, ...	32s.	—s.
Linseed, per qr., Baltic 52s. to 56s.....Bombay	58s.	60s.
Linseed Cake, per ton	£9 10s. to	£11 0s.
Rapeseed, Dutch	58s. to	62s.
Rape Cake, per ton	£5 0s. to	£6 0s.

HOP MARKET.

BOROUGH, Monday, March 26.—We have no change to report in our market, which continues inactive.

Mid and East Kents	84s.,	112s.,	147s.
Weald of Kents................	65s.,	76s.,	84s.
Sussex.........................	65s.,	74s.,	80s.

Mease and Wild.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, Monday, March 26.—During the past week the arrivals have been large, and, with the exception of top samples, less money had to be submitted to. The following are this day's quotations:

York Regents	90s. to 140s.	per ton.
Lincolnshire ditto	80s. to 95s.	,,
Dunbar ditto	100s. to 120s.	,,
Perth, Forfar, Fifeshire Regents	80s. to 100s.	,,
Do., do., rocks and reds	75s. to 85s.	,,
French whites	70s. to 80s.	,,
Belgian ditto	60s. to 70s.	,,

BOROUGH AND SPITALFIELDS.

LONDON, Monday, March 26.—About average supplies of potatoes have come to hand since our last report coastwise and by land-carriage, in middling condition; but the imports have not exceeded 6 bags from Harlingen. Good sound qualities command full prices, but inferior parcels are very dull.

York Regents	100s. to 150s.	per ton.
Ditto Flukes	125s. to 150s.	,,
Essex and Kent	80s. to 120s.	,,
Scotch	85s. to 110s.	,,
Ditto Cups	85s. to 100s.	,,
Dunbars	100s. to 120s.	,,
Foreign	70s. to 85s.	,,

COUNTRY POTATO MARKETS.—York, March 17: Potatoes sell at 10d. per peck, and 3s. per bushel. Leeds, March 20: The show of potatoes sold at 11d. to 13d. wholesale, and 13d. to 14d. retail per 21 lbs. Knaresbro', March 21: Potatoes 13d. to 14d. per 21 lbs. Sheffield, March 20: Potatoes sell at from 9s. to 14s. per load of 18 stones, with a plentiful supply. Richmond, March 17: Potatoes 3s. 4d. per bushel. Manchester, March 20: Potatoes 7s. 6d. to 13s. per 252 lbs.

COVENT GARDEN MARKET.

LONDON, Saturday, March 24.—Vegetables are still scarce and realising high prices. Pine Apples and Grapes are somewhat dearer than they were last week. Good Apples and Pears are scarcely to be had. The former consist of Golden Knob, Bess Pool, and Wyken Pippin, and the latter of Ne Plus Meuris and Beurré Rance. Oranges are plentiful and cheap. Good Cobs realize 1s. to 1s. 6d. per lb. Rhubarb, Asparagus, and Seakale are furnished in small quantities. Parsley is still dear. Green Peas may be obtained at high prices. Potatoes realize 4s. 6d. per bushel. A few new frame ones may be had at from 3s. to 5s. per lb. Mushrooms can still be had in small quantities. Cucumbers are dear. Cut flowers chiefly consist of Orchids, Gardenias, Violets, Mignonette, Camellias, Azaleas, Heaths, Primulas, Geraniums, and Roses.

FRUIT.

	s.	d.	s.	d.		s.	d.	s.	d.
Figs, per doz.	0	0 to	0	0	Pineapples, per lb.....	8	0 to	12	0
Apples, per doz	2	0	6	0	Currants, p. half sieve	0	0	0	0
Oranges per 100	6	0	10	0	Apricots, per dozen ..	0	0	0	0
Melons, each..........	2	0	4	0	Lemons, per 100	5	0	8	0
Cobnuts, per 100 lbs...	100	0	0	0	Plums, per punnet....	0	0	0	0
Mulberries, per lb.....	0	0	0	0	Pears, per dozen	6	0	10	0
Grapes, per lb..........	12	0	20	0	Pomegranates, each ...	0	0	0	
Chesnuts, per peck....	0	0	0	0	Filberts, per 100 lbs...	50	0	60	

VEGETABLES.

	s.	d.	s.	d.		s.	d.	s.	d.
Broccoli, per doz.......	4	0 to	8	0	Beet, per dozen	1	6	2	0
Greens, p. doz bunchess	4	6	6	0	Onions, per half-sieve..	1	0	1	6
Cabbages, per do.......	2	0	3	0	Portugal, each	0	2	0	4
Seakale, per punnet....	2	0	3	0	Celery, per bundle......	1	6	2	0
French beans, per 100..	2	0	3	0	Shallots, per lb.........	0	6	0	8
Asparagus, per bundle .	6	0	10	0	Garlic, per lb...........	0	6	0	8
Rhubarb, per bundle ..	0	6	1	0	Lettuce, cab., per score.	1	0	1	6
Potatoes, per ton	90	0	100	0	Tomatoes, per ½-sieve ..	0	0	0	0
Do. per bush.	3	0	4	6	Endive, per score	1	0	2	0
Do. per cwt.	6	0	8	0	Radishes, turnp, per doz.	0	0	0	0
Do. new, per lb.	0	0	0	0	Horseradish, per bundle	1	6	4	0
Green Peas, per quart..	0	0	0	0	Mushrooms, per pottle .	2	0	2	6
Carrots, per bunch	0	6	0	8	Parsley, per 12 bunches	4	0	8	0
Turnips, per bunch	0	5	0	7	Artichokes, per doz.....	2	0	3	0
Spinach, per sieve......	4	0	5	0	Marjoram, per bunch ..	0	0	0	0
Cucumbers, each	1	0	3	0	Savory, per bunch	0	2	0	4

PRICES OF BUTTER, CHEESE, HAMS, &c.

BUTTER, per cwt.—	s.	s.	CHEESE, per cwt.—	s.	s.
Friesland	116 to	120	Cheshire.................	70 to	86
Kiel......................	120	124	Cheddar..................	74	88
Dorset, new............	120	124	Double Gloucester........	64	74
Carlow..................	106	114	HAMS—		
Waterford..............	106	114	York......................	80	86
Cork	108	120	Westmoreland............	80	86
Limerick	100	106	Irish, new.................	76	84
Sligo	—	—	BACON: Wiltshire, dried.	64	68
Fresh, per doz. 12s. 0d. to 15s. 0d.			Irish, green	58	64

ENGLISH BUTTER MARKET.

LONDON, Monday, March 26.—Our trade, for new Butter even, is not active, notwithstanding the cold and backward spring.

Dorset, fine............	124s. to 126s.	per cwt.
Ditto middling	110s. to 112s.	,, ,,
Fresh Butter	12s. to 15s.	per doz.

DERBY.—The show of cheese was perhaps the best ever remembered, consequently it sold quickly at prices ranging from 70s. to 80s.; inferior lots made less, and a few of the finest dairies realized 2s. to 4s. more. Mr. Travis's noted dairy of coloured, we were told, fetched 88s.

GLASGOW, (Wednesday last.)—A small supply, mostly inferior, and readily sold. There were eight tons passed the weigh-house scales, and one cart in the Bazaar. Prime early-made, 65s. to 67s.; late-made and inferior, 57s. to 61s.; skim, 30s. to 32s. per cwt.

BREAD.

LONDON, Friday, March 23.—The prices of wheaten Bread in the metropolis are—

Wheaten Bread, per 4lbs. Loaf	7d. to	7½d.
Household Do. ,, ...	5d. to	6½d.

CHICORY.

LONDON, Saturday, March 24.—Both English and foreign Chicory, the supplies of which are moderate, move off slowly on former terms.

ENGLISH, per ton	£13 0 to	£14 0	ANTWERP ...	£13 10 to	£14 10
HARLINGEN....	13 10	14 10	DACKUM	0 0	0 0
BRUGES	13 10	14 10	GUERNSEY....	13 0	14 0
HAMBURG......	13 0	13 10	BELGIUM	13 10	14 10

HAY MARKETS.

LONDON, Saturday, March 24.—SMITHFIELD.—Trade slow, but prices rule firm. Supplies only moderate.

CUMBERLAND.—A moderate demand, at late rates.

WHITECHAPEL.—Trade steady.

At per load of 36 Trusses.

	Smithfield.		Cumberland.		Whitechapel.	
MEADOW HAY ..	50s. to	90s.	55s. to	92s.	50s. to	90s.
CLOVER	80s.	105s.	80s.	105s.	85s.	105s.
STRAW............	26s.	30s.	26s.		25s.	30s.

OIL MARKET.

OILS.

Olive, Florence, half-chests ...	£1 10 0 to	£0 0 0
Lucca..............	1 1 0	0 0 0
Gallipoli (252 gals)	61 0 0	62 0 0
Spanish..........	58 0 0	60 0 0
Linseed (cwt.) ..	1 7 6	1 8 0
Rape, Pale	1 19 0	2 2 0
Brown	1 18 6	1 19 0
Cod (tun).........	36 0 0	36 5 0
Seal, Pale	36 0 0	36 5 0
Do. Brown, Yel. &c	30 0 0	34 0 0
Sperm	97 0 0	100 0 0
Head Matter	101 0 0	0 0 0
Southern.........	31 0 0	33 0 0
Cocoa-nut (cwt.).	1 18 0	2 5 0
Palm	1 18 0	2 6 0

RESIN.

Yellow (per cwt.)	£0 6 0	0 6 6
Transparent	0 6 0	0 6 6

PITCH.

British (per cwt.)	£0 6 0	0 6 3
Archangel	0 0 0	0 0 0
Stockholm	0 10 3	0 0 0

TURPENTINE.

English (per cwt.)	£1 15 0	0 0 0
American	1 16 0	0 0 0
Rough	0 0 0	0 9 6

TAR.

American........	£0 0 0	0 0 0
Archangel	1 1 6	1 2 0
Stockholm	1 3 0	1 0 6

WHALEBONE.

Greenland, full size (per ton).	£400 0	£430 0
South Sea........	370 0	0 0

0

WINES.

LONDON, FRIDAY, March 23.—In Wines we notice a good demand for stout red and white Wines of European growth, but Capes continue very dull and difficult to move.

The Chancellor of the Exchequer has accepted the proposal agreed to at the meeting on Tuesday last, by those wine dealers who had kept their stocks under excise survey, that they should receive drawback on all duplicate warrants, dated within two years for red wine, and six months for white, provided they have a sufficient quantity of wine of a like description in stock, and they forego any further claim when the duty is again reduced.

At a meeting of committees of the various trades dealing in foreign and colonial produce, it was resolved to propose to the Chancellor of the Exchequer to abandon his resolution in Customs acts relating to registration fee, charges for removals under bond, and for operations in warehouses, and substitute instead a 1s. stamp on a fourth bill of lading, to be lodged at the Custom House, and to add one-half per cent. to the duties on consumable articles. These matters are still under consideration.

	£	£
Port, very super. old, pr. pipe	60	70
Good old	50	55
Good young	38	40
Common and fair	33	35
1858's	48	52
Red Wines, from Oporto	—	—
Lisbon White dry	28	30
Do. rich	32	38
Red	28	30
Bucellas	36	44
Carcavellos	38	42
Figuera	—	—
Sherry, very superior, p. butt	70	80
1st class	50	60
2nd and 3rd do.	36	45
Fair useable qualities	24	32
Common and indirect	14	20
Mountain, London Particular, per pipe	—	—
2nd quality	25	30
Lower do.	—	—
Spanish, red, good, per tun	17	18
Common and fair, (scarce)	25	23
Clarets, 1st growths, per hhd.	60	65
2nd do.	35	50

	£	£.
Clarets—*(continued.)*		
Other qualities, per hhd.	16	25
Cargo	8	12
Hermitage, rd. & wh., 1st grth.	40	44
ordinary quality	14	16
Masdeu, per pipe	—	—
French Red	20	22
Champagne, 1st qual., pr. doz.	—s	—s
Other qualities	—s	—s
Sauterne } 1st quality	—s	—s
Barsac } other qualities	—s	—s
Hock, superior, per aum	£35	£50
Other qualities	10	30
Moselle, 1st quality	20	25
2nd quality	10	16
Madeira, E.I., 1st qual., p. pipe	80	95
West India, 1st quality	75	85
Direct	50	65
Sicilian Red	—	—
Marsala	22	25
Cape White, good	£14	£14 10s.
Common and fair	£13	£——s.
Cape Red, good	18	19
Common & fair	16	17
Teneriffe, London Particular	36	—
2nd quality	24	—

MATTHEW CLARK & SONS.

SPIRITS.

LONDON, SATURDAY, March 24.—There has been a moderate demand for Rum at about previous currencies. Proof East India 1s. 7d. to 1s. 8d.; proof Leewards 1s. 8d. to 1s. 9d. per gallon. Brandy is heavy, on rather easier terms. Considerable sales of Geneva have taken place. Plain Geneva spirit is quoted at 1s. 7d. to 1s. 8d. proof.

RUM.

	s.	d.	s.	d.
E. India, proof per gal.	1	7 to	1	8
Leewards, do.	1	8	1	9
„ 10 to 20 O.P.	2	3	2	7
„ 21 29 „	3	10	4	2
Demerara 30 34 „	2	1	2	4
„ 24 40 „	2	4	2	5

	s.	d.	s.	d.
Jamaica, 26 to 29 O.P.	3	7	3	9
„ 32 36 „	4	0	4	2
Better quality } 32 36 „	4	2	5	10
Superi'r Marks } 36 40 „	5	4	5	6

BRANDY—COGNAC.

Vintage	Shipped by Martell.				Shipped by Hennessy.				Shipped by Otard.				Shipped by Vineyard Proprietors' Com.			
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
1857	12	0 to	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1858	10	8	10	9	10	10	0	0	10	3	0	0	10	0	0	0

Hhds. 2d. per gallon higher. Puncheons scarce.

Other Shippers	7	0 to	8	6
HOLLANDS, Geneva fine, for duty	2	8	2	9
Other qualities, to arrive and on the quay	2	2	2	4
BRITISH GIN, for exportation, proof hhds.	3	0	3	3

BRITISH SPIRITS.

GIN, proof, cash	2	4	0	0

BARK, &c.

LONDON, SATURDAY, March 24.

	£	s.	£	s.
English, per ld. of 45 cwt. del. in London	17	0 to	21	0
Coppice	18	0	22	0
Dutch, per ton	6	0	7	0
Hambro'	6	0	7	0
Antwerp Tree	7	0	8	0
Do. Coppice	7	0	8	5
Mimosa, Chopped	8	0	9	0
Do. Ground	10	5	11	0
Do. Long	7	0	8	10

	£	s.	£	s.
Cork Tree, Barbary	8	0	8	5
Do. Sardinian	11	0	11	15
Vulonia, Smyrna, p. ton	15	0	17	0
Do. Camata	15	0	17	0
Do. Morea	10	0	12	0
Terra Japonica } Gambier	16	15	17	0
Terra Japonica } Cutch	26	0	29	0
Divi Divi	10	0	12	0
Myrabolams	7	0	10	0
Sumach, Sicily, p. cwt.	0	14	0	15

HIDE AND SKIN MARKETS.

LONDON, SATURDAY, March 24.

MARKET HIDES:	s.	d.	s.	d.
56 to 64 lbs.	0	4	0	4½
64 to 72 lbs.	0	4½ to	0	4½
72 to 80 lbs.	0	4½	0	5
80 to 88 lbs.	0	5	0	5½
88 to 96 lbs.	0	5½	0	6
96 to 104 lbs.	0	6	0	6½
104 to 112 lbs.	0	0	0	0

	s.	d.	s.	d
HORSE HIDES, each	9	0 to	11	0
CALF SKINS, light	3	0	5	0
Do. full	8	0	0	0
Shearling	0	0	0	0
Kents and Half-breds	8	6	10	0
Downs	6	6	8	0
Polled Sheep	9	6	11	0
Lambs	0	0	0	0

TIMBER.

LONDON, SATURDAY, March 24.—We have to report rather an extensive business doing in nearly all kinds of Timber, and a decided firmness in prices generally.

TIMBER. (Per load 50 cubic ft.) Import Duty 1s per Load.	s.	d.	s.	d.
FIR, Riga	65	0 to	70	0
Dantzic and Memel crown best	70	0	80	0
second	50	0	65	0
small	45	0	57	0
Stettin	50	0	65	0
Swedish	50	0	53	0
small	44	0	47	0
Norway Balks	40	0	45	0
PITCH PINE, United States	75	0	80	0
OAK, Memel, crown	105	0	125	0
brack	75	0	85	0
Dantzic and Stettin, crown	100	0	115	0
brack & unsquared	55	0	75	0
WAINSCOT. (Per log 18 cubic ft.)				
Riga, crown	107	6	117	6
brack	82	6	87	6
Memel and Dantzic crown	87	6	97	6
brack	67	6	77	6
DEALS & BATTENS. (Per Petersburg standard hundred.) Impt. Duty 2s. per Ld.	£	s.	£	s.
Archangel and Onega	14	0	15	0
Seconds	11	0	12	0
Petersburg	12	10	13	5
Wyburg	11	0	11	10
Finland and Handsawn Swedish	9	0	10	0
Petersburg and Riga White Deals	10	0	11	5
Memel and Dantzic crown Red Deals	14	0	15	10
brack	9	10	10	10

Christiana & Sannesund Deals, White & Yel.	13	0	14	10
Second do.	9	10	11	0
Dram & Frederickstadt Battens do.	8	10	10	10
Dram 6½-inch do.	8	0	9	0
Gothenb'g, good Stocks	10	10	11	10
Common	9	0	10	0
Gefle & Swedish 14-ft. Deals	9	10	12	0
Swedish Deals & Battens, long Millsawn	10	0	11	15
Dantzic, crown deck, per 40-ft. 3-in.	20s.		26s.	
brack	14s.		18s. 6d.	
LATHWOOD. (Per cubic fathom.) Import Duty 1s. per load.	£	s.	£	s.
Petersburg	8	15	9	15
Riga, Dantzic, Memel, and Swedish	0	0	0	0
FIREWOOD. (Per cubic fathom.)				
Swedish Red Deal Ends	4	10	0	0
Norway Red & White Boards	3	15	0	0
Round & Slabs	3	0	3	5
STAVES. (Per mille pipe.) Import Duty 1s. per Load.				
Memel, crown	£200	0	210	0
First brack	170	0	175	0
Dantzic, Stettin, & Hambro', full siz'd crown	160	0	210	0
Canadian stand. pipe	50	0	62	10
Culls	37	0	40	0
Pun., per 1200 pieces	14	0	16	10
Bosnia, thin brl. do.	26	0	28	0
United States, pipe	18	0	33	0
Hhd., heavy	20	0	30	0
slight	12	0	16	0

LEADENHALL LEATHER MARKET

LONDON, SATURDAY, March 24.—Moderate supplies of fresh Leather have been on sale here this week. Generally speaking, the demand has ruled steady, but far from active, at full prices. Raw hides maintain last week's currency.

CROP HIDES.

ENGLISH

lbs.	lbs.		d.	d.
28 to	35	....	14 to	17
36	40	....	15	18
40	45	....	16	19
43	50	....	17	20
50	55	....	18	21
56	60	....	18	22

BUTTS.

ENGLISH.

lbs.	lbs.		d.	d.
14	16	....	17	22½
17	20	....	17½	24
21	24	....	18½	27
25	28	....	20	29
29	32	....	21	31
33	36	....	21	32

FOREIGN.

lbs.	lbs.		d.	d.
16	20	....	16	21
21	24	....	16	24
25	28	....	16	25
29	32	....	17	26
33	36	....	17	27
36	45	....	17½	24
45	50	....	18½	25
—	—	....	—	—

OFFAL.	d.	d.
English Shoulders	13	16½
Do. Cheeks and Faces	7	10
Do. Bellies	10	12
Do. Middles	12	13
Foreign Shoulders	11	14
Do. Necks	10	12
Do. Bellies	9	11½
Do. Middles do.	12	13
Dressing Hide Shoulders	10	12
Do. do. Bellies	8½	10
Kip Shoulders	6	8
Do. Bellies	5½	7

DRESSING HIDES.

	lbs.	lbs.	d.	d.
Common	20 to	24	14 to	15
Do.	25	28	14	15
Do.	30	34	14	16
Do.	35	40	14½	17
Saddlers	30	35	16	18
Do.	36	50	17	19
Bulls			12	14
Shaved	14	16	18	19
Do.	17	19	16½	18½
Do.	20	23	16	18
Do.	24	28	15½	18
Scotch do.	16	24	16½	19
Coach, per Hide			25s. to	32s

HORSE BUTTS. SHAVED

	d.	d.	d.	d
English	10 to	12	13 to	15
Spanish	11	12½	13	15

HORSE HIDES.

	lbs.	lbs.	d.	d.
English	13 to	18	12 to	14½
Do. without butts	9	14	13	16
			s. d.	s. d.
Spanish salted, without butts, per hide.	6	9	11 0	16 0
Do. do. do.	9	12	13 0	17 6
Do. do. do. inferior			8 0	10 0
Do. dry do.	6	8	9 0	14 0
Do. do. do.	9	11	12 0	15 0
Do. do. do. inferior			6 0	8 0

CALF SKINS.

Av. weight.		Unrounded.		Rounded	
lbs.	lbs.	d.	d.	d.	d.
20 to	28	16 to	20	19 to	27
30	35	17	21	20	28
35	40	17	21	21	30
40	45	17	22	21	31
45	50	17	22	21	30
50	55	17	21	21	29
55	60	16	20	20	28
60	70	15	19	19	27
70	80	15	18	18	26
80	90	15	17	17	25
90	100	14	16	16	23
100	120	14	15	15	21

KIPS.

	lbs.	lbs.	d.	d.
Petersburgh	4 to	7	20 to	22
Do.	7	9	18	21
Do.	9	10	18	20
Do.	11	13	17	19
E. Ind. dry sltd.	5	7	20	24
Do. do.	7	9	19	22
Do. seconds			16	18
Do. thirds			12	15
Do. inferior			8	11

SUNDRIES.

	s.	s.
Hog Skins, best each	9 to	14
Do. seconds „	6	9
Seal Skins, split, per doz.	46	66
Do. for bindings „	34	66
Calf Skins, Sumach-tanned „	30	45
Do. white „	30	50
Horse Hides, white, each	8	14
Sheep Skins—	d.	d.
Basils, unstrained, per lb.	9	16
Do. strained „	9	16
Do. facing, per doz.	7s.	19s
Tan, Sheep, & Lambs „	10	24
White Sheep, per 120	50	90
Do. Lambs, „	40	80
Do. Sheep & Lambs, strained, per doz.	6	16
Sumach Roans, per doz.	16	35
Do. Skivers, „	12	30
Bark Skivers, „	12	30
Hide Splits, per lb.	9 to	11d

WOOL MARKETS.

ENGLISH WOOL MARKETS.

LONDON, Monday, March 26.—Since our last report, there has been a moderate demand for long wools, and prices have ruled firm. For short wools, however, the inquiry has ruled somewhat heavy; nevertheless, holders have continued firm. For shipment to the Continent, the transactions are limited.

Per sack of 240lbs.			
Fleeces—Southdown Hogs	£19 10	to	£20 0
Do. Half-bred Hogs	19 0		19 10
Do. Kent	18 0		18 10
Do. Southdown Ewes & Wethers	17 0		18 0
Do. Leicester do.	17 10		18 0
Sorts—Clothing, picklock	19 0		20 0
Do. Prime and picklock	18 0		19 0
Do. Choice	17 0		18 0
Do. Super	15 0		16 0
Do. Combing—Wethermatching	20 0		21 0
Do. Picklock	17 0		18 0
Do. Common	16 0		16 10
Do. Hog-matching	23 10		24 0
Do. Picklock matchig	18 10		19 10
Do. Super do.	16 0		16 10

BRADFORD WOOL MARKET, (Thursday last.)—The business of the past week has not been any improvement on former weeks. The sales that have been effected are at full prices, especially for bright-haired. In Noils and Shorts the demand is steady, and prices are without alteration.—*Bradford Observer.*

LEEDS (English and Foreign) WOOL MARKET, Friday.—There is not much briskness in the demand for fleece wool, but there is great confidence in prices being maintained. In colonial wool there is a fair business doing at prices corresponding with the improvement in London. Low wools are in good demand, and some sorts are rather higher.

LIVERPOOL WOOL MARKET, March 24.

Scotch.—The demand for Laid Highland is limited, and consumers only take for immediate wants, and that of the best class, at about late rates. White Highland rather more inquired for, with light stocks. There continues a fair demand from the manufacturers for the best class of Cheviot at full rates: the inferior kinds are neglected.

	s. d.		s. d.
Laid Highland Wool per 24lbs.	11 0	to	12 6
White Highland do.	14 6		18 0
Laid Crossed do...unwashed	14 6		16 6
Do. do...washed	16 0		18 6
Laid Cheviot do...unwashed	17 0		20 0
Do. do...washed	19 6		26 0
White Cheviot do...washed	32 0		40 0

Foreign.—The attention of the trade has been taken up with the public sales in London this week. The quantity of low wool offered was not large; the attendance good, and late rates fully maintained; and there has only been a moderate amount of business doing here during the week. A considerable public sale of Port Philip is to take place here early next month.

BRESLAU WOOL REPORT, March 22.—Our trade is maintaining its almost exceptional position of a continual inquiry for all descriptions on store; and considering the scantiness of provisions, the weekly transactions may be called important indeed. They amounted during the last fortnight to nearly 3,800 cwts., consisting of almost all kinds, except superfine qualities, which are wanting entirely. The prevalent demand has been exhibited for Volhynian, Russian, Polish, and Posen fleeces, at from 65 to 78 thalers, as well as for Charkow scoured wools, at from 95 to 100 thalers per cwt. The latter have been acquired partly by Berlin, Saxon, and Austrian commissioners, staplers, and manufacturers, and partly by combers, who used them for combing purposes. In the meantime home manufacturers and Netherland commissioners have been purchasing the lower sorts, as well as some flocks of Silesian sliped wools, at from 64 to 74 thalers. Supplies have become very light, and do not altogether surpass 7,000 cwts., most of which are from Russia. Some extensive contracts have at the same period been concluded on the sheep's back, at a rise of 5 to 8 per cent. above last year's June-fair quotations. Gunsburg, Wool-broker.

FOREIGN AND COLONIAL WOOL MARKET.

Per lb.	s. d.		s. d.
German, Saxon, and Prussian. 1st and 2nd Elect.	3 4	to	4 6
Prima	2 4		3 0
Secunda	2 0		2 4
Tertia	1 8		1 10
Colonial:—Sydney—Lambs	1 10		2 1½
Scoured do.	1 8		3 0
Unwashed	1 1		1 3
Locks and Pieces	1 0		1 10½
Slipe and Skin	1 6		1 6½
Port Philip—Lambs	1 6		2 3
Scoured do.	1 8		2 11½
Unwashed	0 11		2 5½
Locks and Pieces	1 5½		1 9½
S. Australian—Lambs	1 10		2 1
Scoured do.	1 1½		2 4½
Unwashed	0 10		1 3
Locks and Pieces	0 7		1 1
V. D. Land—Lambs	1 10½		2 3½
Scoured do.	1 2		2 10½
Unwashed	0 11½		1 5
Locks and Pieces	1 3		1 7½
Cape of Good Hope—Fleeces	1 2		2 4
Lambs	1 2½		2 3
Scoured	0 9		2 7
Unwashed	0 10		1 3½

MANURES.

LONDON, Monday, March 26.—There were no imports of Peruvian Guano last week. Exports 1,102 tons. The demand continues good for all kinds of raw materials used in the manufacture of Superphosphate of Lime. Linseed-cakes are scarce, and are readily sold at the quotations. Cotton-seed Cakes none offering.

PRICES CURRENT OF GUANO, &c.

PERUVIAN GUANO (per ton, for 30 tons)	£12 5 0	to	£12 10 0
Do. do. (under 30 tons)	13 0 0		13 10 0

ARTIFICIAL MANURES, &c.

Nitrate Soda per ton	£15 0 0	to	£15 10 0
Sulphate of Ammonia	14 0 0		14 10 0
Muriate of ditto	16 0 0		20 0 0
Corn Manure	6 10 0		7 0 0
Superphosph. of Lime	5 0 0		5 10 0
Salt	1 0 0		1 5 0
Coprolite (gr'd)	2 12 6		2 15 0
Ditto (whole)	2 0 0		2 5 0
Estramadura Phosph. of Lime for 70 p. ct. p. ton	4 5 0		4 15 0
Gypsum	£1 5 0	to	£1 10 0
Bone Ash, for 70 per cent.	4 7 6		4 10 0
South American Bones	4 15 0		5 0 0
London ditto, uncrushed	4 12 6		4 15 0
Do. ½ inch p. qr.	0 17 0		0 19 0
Do. dust	0 19 0		1 0 0
Animal Charcoal	4 5 0		4 10 0
Oil of Vitriol, concentrated, per lb.	0 0 1		0 0 0
Do. Brown	0 0 0¾		0 0 0

OIL-CAKES.

Linseed-cakes, per ton—			
Thin American, brls	£10 17 6		£11 5 0
Ditto bags	10 7 6		10 15 0
Marseilles	8 12 6		9 10 0
English	10 0 0		10 10 0
Rape-cakes	£5 10 0	to	£6 0 0
Cottonseed Cakes—			
American decorticated	none.		0 0 0
Ditto, English	6 0 0		6 10 0

JOHN KEEN, Agent, 35, Leadenhall-street.

Agricultural Chemical Works, Stowmarket, Suffolk.

Prentice's Cereal Manure for Corn Crops	per ton	£8 10 0
Mangold Manure	,,	8 0 0
Prentice's Turnip Manure	,,	6 10 0
Prentice's Superphosphate of Lime	,,	6 0 0

Manufactured by Hodgson and Simpson, Wakefield, and Matthews and Co., Driffield, Yorkshire.

Nitro-Phosphate	per ton	£6 10 0
Ammonia-Phosphate	,,	8 0 0

LIVERPOOL GUANO AND SEED, &c. MARKET, March 24.—Guano: import 1,350 tons of Chincha; this week there has been more inquiry for the inferior qualities at the quotations, which are readily obtained. For Bone Ash higher prices have been obtained; very inferior sold at £4, and fair to good at £5 to £5 10s. per ton. Cattle Bones have also advanced, present prices are £5 to £5 5s. for common. Nitrate of Soda, import 880 tons; market very firm, and prices a shade dearer; extensive speculative purchases have been made for arrival, at 14s. Linseed Oilcake in demand. Cotton Cake, prime very firm, at £7 17s. 6d. to £8 15s. per ton, according to quality. Of Cloverseed large arrivals, with small sales.

Guano, Peruvian	£12 0 0	to	£13 0 0
Do. Upper do.	5 0 0		7 0 0
Ichaboe, per ton	4 5 0		5 10 0
Patagonian	3 15 0		4 0 0
Saldanha Bay	4 0 0		6 0 0
Kooria Mooria	4 0 0		6 0 0
Pedro Keys	3 0 0		5 0 0
Sulphate of Amo.	14 0 0		15 10 0
Bone Ash	4 15 0		6 10 0
Linseed Cake per ton—			
American, bags	£9 15 0	to	£10 0 0
English	10 10 0		10 15 0
Cottonseed Cake	7 7 6		8 0 0
Locust Beans p. ton	5 15 0		6 0 0
Nitr. of Soda, p. ct.	0 13 6		0 16 0
Linsd. Bomby, p. qr.	2 12 0		0 0 0
Cloverseed, American, red, new, per cwt.	2 2 6		2 7 6
Tallow, 1st P.Y.C.	3 0 0		3 1 0

SAMUEL DOWNES, General Broker,
Exchange Court, Liverpool.

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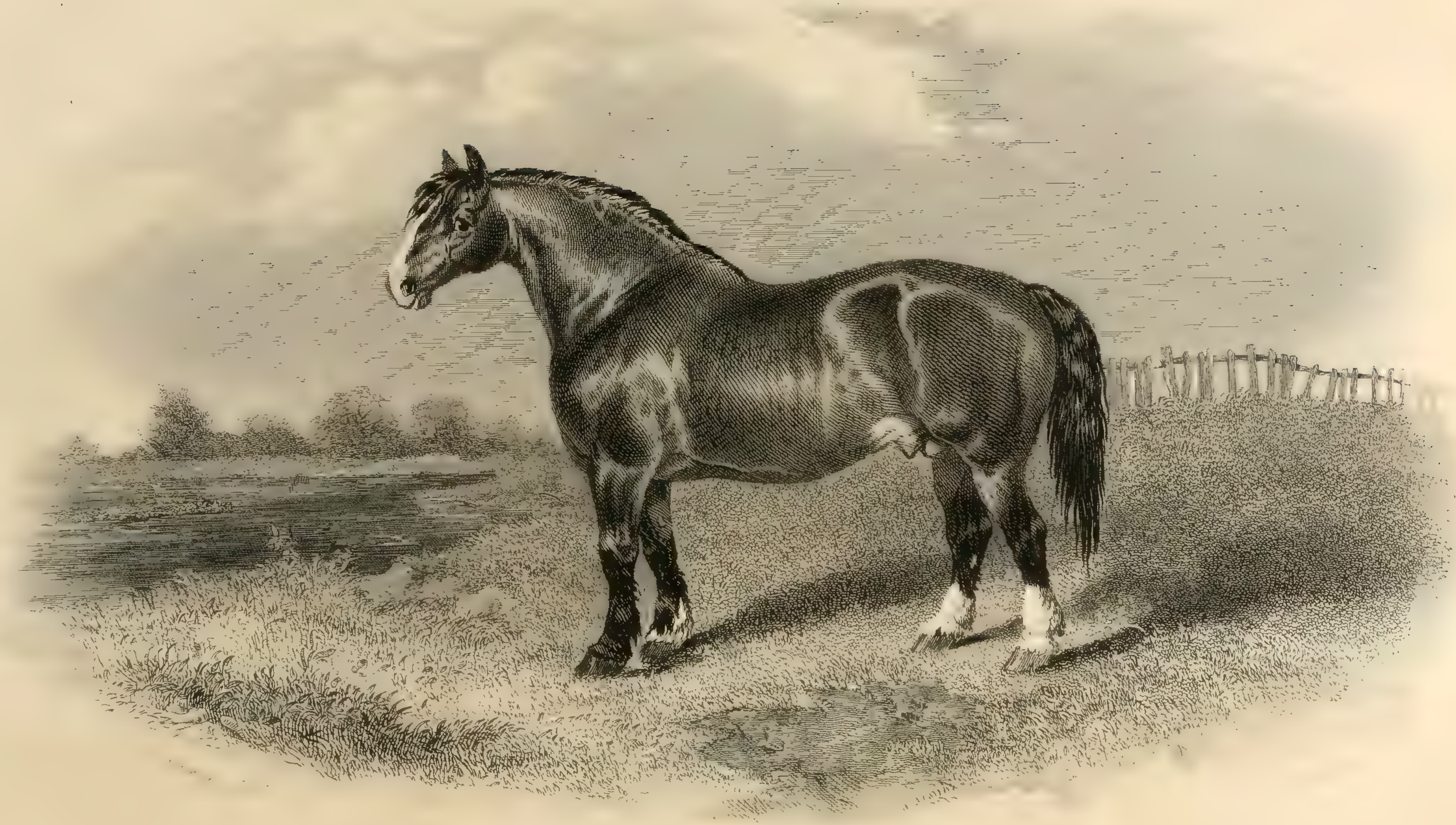

THE FARMER'S MAGAZINE.

MAY, 1860.

PLATE I.

THE ROYAL CONQUEROR, A CART STALLION,

THE PROPERTY OF MR. THOMAS GROVES, OF PARK HOUSE, SPOFFORTH WETHERBY, YORKSHIRE.

The Royal Conqueror, bred by Mr. William Buller, of Hanwell Fields, near Banbury, Oxfordshire, in 1852, was got by the Lion, dam by Sampson. This Lion, also bred by Mr. Buller, was by Mr. Law's Black Lion; and he, in turn, by Mr. Peddy's (of Mexbury) Lion. The dam of *the* Lion was by the celebrated Champion, the property of Mr. Ivens, of Eyden; and Champion himself was by Mr. Golby's Old Conqueror, "one of the best stock-getters in England."

The Royal Conqueror takes his title from the fact of his having won the first prize of 15 sov. for Dray Horses at the Salisbury meeting of the Royal Agricultural Society of England. Mr. Groves took the first premium for thorough-bred horses at the same show with Hobbie Noble; and made the most of the occasion by purchasing the Conqueror of his breeder Mr. Buller, in whose name the horse went to Salisbury. In a week or two from this the Conqueror received a first class silver medal at the York show of the Yorkshire Agricultural Society; and subsequently the first prize and silver cup at Halifax, the first prize at Keighley; and the prize at Otley in the autumn of last year. He has proved himself in a still more satisfactory manner as a famous stock-getter. The first prize two-year-old filly, and the second prize two-year-old colt, at the Royal Agricultural Society's meeting at Warwick, were both by him, and thirty of his foals shown *together* during last year were generally pronounced unparalleled as a class.

The Royal Conqueror is a brown horse, standing seventeen hands and a-half high. He is full of bodily substance, has great muscular power and immense bone, with good feet and remarkably short legs. He is still warranted perfectly sound in every respect. We have not, however, seen him since Salisbury, and any efforts of our own at a description would fail after the following, which we transfer intact from Mr. Groves' card:

"This horse the Royal Conqueror's named,
For taking the Royal Prize he's famed;
For action, bone, and size he's got,
His strength is in the proper spot.
Not in his head, like some great moulders,
But in his arms, and chest, and shoulders.
He's free from every spot or blemish,
His temper's good and no way whimish;
His body and his loins are good,
Nor fails he ere to take his food;
Not like your dainty appetite,
Which is o'er done by the mere sight.
When passing their windows people say,
A cloud is coming o'er this way.
His neigh is pure, like music sweet,
Not hoarse nor harsh, like some we meet;
His feet are good, no sidebones cramp,
Like many horses of his stamp;
His age is only eight this spring,
So farmers say he's just the thing,
Of which in Yorkshire we're most needy,
For all our mares have got too weedy.
He's seventeen and a-half hands high,
His looks are handsome with fine eye:
His hair is silky, soft, and bright,
His quarters long, his hocks are right.
His legs are so remarkably short,
That many wish theirs had that sort;
And in conclusion, people say,
There's nothing like him of the day."

The Royal Conqueror's price is two guineas a mare, and he will travel in the neighbourhood, as well as being shown at Knaresbro', Wetherby, Leeds, Wakefield, Bradford, and Otley. He is in very good company at Spofforth, where Mr. Groves has also the blood stallions Windhound, the Hadji, Gameboy, and Colonist; the Flying Buck, a roadster, that took the Royal Society's premium at Windsor, in 1851; and two other cart-horses, Sampson, a winner of three prizes at the Royal Agricultural Society's shows, and the Yorkshire Hero. The stock at the Park House Paddocks further includes nearly forty well-bred brood mares, and a few promising yearlings by Alarm, Hobbie Noble, and Gameboy.

PLATE II.

A SHORTHORN STEER,

THE PROPERTY OF MR. RICHARD STRATTON, OF BROAD HINTON, SWINDON.

This steer, bred by Mr. Stratton, at Broad Hinton, was calved on March 15th, 1856. He was got by Nottingham (15014), out of Red Prim by Red Duke (8624); her dam Prim, by Phœnix (6290).

Nottingham was by Mr. Booth's famous Harbinger, out of Princess, by Noble. He has already shown himself to be a capital stock getter, and Mr. Stratton advises us that he has some further proof of his excellence in preparation for next Christmas.

At the Birmingham Cattle Show, in December, 1858, this steer took the first prize of 10 sovs. as the best shorthorn steer, with the Silver Medal to Mr. Stratton as his breeder; and he also won a private sweepstakes in the same class. In the following week, at the Smithfield Club Show, he took the first prize of 25 sovs. as the best shorthorn steer, with the Gold Medal as the best ox or steer in any of the classes, and the Silver Medal for the breeder. The beast was sold here to Mr. Davis, of the Black Bull, New Cattle Market, for £70. Instead of killing him, his new owner put him up in a lottery, and the lucky winner sold him back again to Mr. Stratton for £50. The steer, however, had contracted the foot and mouth disease at the Birmingham Meeting, and he came home quite out of form. But he was so well done by, during the spring and summer, that at the Midland Counties Show following he once more took the first prize of 10 sovs., this time as the best ox—the shorthorn Judge standing out for him as the Gold Medal animal. On his way thither, he had called in at Rugby, where he carried off the great prize of the day, one of 15 sovs. for the best beast. The rules of the club prevented his re-appearance at Smithfield, but at York he received another first prize of 8 sovs. as the best shorthorn ox. He was sold here to Mr. Rooth, of Chesterfield, who got him beaten at Darlington by an ox of the Duke of Cleveland's, and then killed him. Few animals ever died better.

This steer was thought by many good judges to be quite a model of what a shorthorn should be. He never, however, went on quite kindly after his illness, or he might have been the Gold Medal ox of both the Great Shows—of one in 1858, and the other in 1859. On either of these occasions we have had to give those points in his history we have now epitomized; and that will be found to be further referred to in the chapter on the Broad Hinton Herd, of which the print comes in appropriate illustration.

OUR ROOT CROPS.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

The growth of root crops seems in some portions of our island to be annually attended with greater difficulty. This failure in producing either the swede or the common turnip as successfully as in former years, has been the source of much anxiety. It may then, at this season of turnip sowing, be useful if we collect together a few facts, which since last turnip-seed-time have been made public relating to our old root crops, and also to a little-cultivated variety—the kohl-rabi.

In a recent paper in this magazine (see ante, p. 287), I addressed myself to the use of the dry and the water drill in turnip sowing, and I then adduced facts which seem to prove that the application of a very limited amount of water (say about a ton per acre) mixed with superphosphate of lime produced very considerable good effects in the weight of the crop of roots. These trials I am much inclined to believe can hardly be too carefully considered and verified by the turnip grower; and from other observations I think it would also be well if the effect on the turnip was ascertained, of superphosphate of lime made *exclusively from crushed bones, without any admixture of coprolite.* These conclusions are supported by the results of some valuable comparative trials made in the season of 1859, by a committee of the Killucan Agricultural Club. For the report of those experiments I am indebted to the *Irish Agricultural Review*, a periodical ably edited by Professor Cameron.

The English farmer will remember that these investigations were conducted on *Irish* acres, and that an Irish acre contains 7,840 square yards, whilst an English acre has only 4,840, and that moreover the emerald islanders enjoy a fine moist climate, excellently adapted to the growth of turnips.

The Killucan Club, at their monthly meeting in March 1859, resolved to test the efficacy of different manures on the turnip crop, applied separately, and also combined with one another. A committee was appointed to conduct the experiments. Joseph E. Purser, Esq., of Corbetstown, the secretary of the club, afforded the manures, and prepared two Irish acres in a field along with his other green crops, which had formerly been two years in oats after three years' grass, in rather poor condition. No field could be better adapted or better prepared, the former manures being fully exhausted, and not a weed or lump to be seen. On the 30th of May the drills were formed, 27 inches wide; the committee met on the 31st, it being resolved that each kind of manure should be applied at the rate of £6 per Irish acre; they were all carefully weighed, apportioned, put on, covered in, and the seed sown, from one o'clock on the 31st of May to four o'clock p.m. on the 1st of June, and so equally did they appear over ground that on the 8th there was not a blank to be seen in any of the lots. They were singled out by hand to nearly 12 inches apart, and hoed the first week in July. During the time of their growth very little difference was perceptible; but by careful observation the lot manured with dissolved bones applied in a liquid state might be seen to keep in advance. The ground was laid off into eight lots of one rood, containing twelve drills each, and sown with two kinds of Swedish turnip—Skirving's, and imperial purple-top (with the exception of the first three lots, on which three kinds of manure were applied). The committee again met on the 22nd of November, and after examining the crop (which they considered to be as equal as any they had ever seen) came to the conclusion that about the middle of the lots they could take a fair average; seven yards of a drill of both kinds of turnip on each lot were carefully weighed. The value of the artificial manures employed was in each case six pounds per Irish acre, except in the cases of the last but two and three in the list, where the cost was three pounds per acre. The following table shows the results obtained:

MANURES APPLIED.	QUANTITY PER ACRE.		KINDS OF TURNIPS.	WEIGHT PER ACRE.	
	Cwt.	Qrs.		Tons.	Cwt.
Galway kelp	17	0	Imperial	39	14
Townsend's	13	3	do.	45	0
London Company's	14	0	do.	43	14
Peruvian guano	8	2	Imperial	43	8
			Skirving's.	43	1
Phospho-Peruvian guano	9	2	Skirving's.	44	13
			Imperial	44	13
11 cwt. bone dust, mixed with 4¼ cwt. Peruvian guano	15	1	Imperial	43	14
			Skirving's.	38	5
12 cwt. bone dust, dissolved in 4½ cwt. sulphuric acid, diluted with 168 gallons of water	16	2	Skirving's.	48	10
			Imperial	43	7
6 cwt. of bone dust, 2¼ cwt. of acid, 30 tons farm-yard manure	..		Imperial	46	12
			Skirving's.	37	5
8 cwt. superphosphate, 30 tons farm-yard manure	..		Skirving's.	45	0
			Imperial	42	15
60 tons farm-yard manure	..		Imperial	45	12
			Skirving's.	44	7

The committee made the very important observation that, of the turnips grown by different manures, some were all sound turnips, and others produced a large proportion of unsound bulbs. Of those grown with Townsend's manure one-eighth were unsound; of the Imperials grown by the phospho-Peruvian guano, nearly one-fifth; of both those kinds grown by the mixed bone dust and Peruvian guano one-eleventh were unsound. And the committee also drew the attention of the club to the fact, that in these trials the mixture of bone dust and sulphuric acid diluted with 168 gallons of water, produced about three tons of bulbs per Irish acre more than any of the other dressings employed; which they consider the more remarkable, as the bones had been only imperfectly dissolved.

The result of another valuable series of experiments, conducted by Mr. John Dove, of Eccles-Newton, Kelso, tend to similar conclusions with those of the Killucan Club.

The trials of Mr. Dove were instituted with the very important object of determining the comparative value of various substances as a substitute for Peruvian guano. They were carried on in the season of 1858; and they extended to cereals as well as turnips; but it is the results of the last-named series only that I propose to extract from the prize essay (*Tran. High. Soc.* 1860, p. 213).

The chief manures employed were Peruvian guano, which cost £12 10s. per ton; nitrate of soda, and sulphate of ammonia, at £18 10s. per ton; the superphosphate of lime, at £8 10s. per ton; and the rape cake, at £6 5s. per ton. In all the experiments, as nearly as possible, the same money value of manure was applied to each lot. The following table gives the analysis of the superphosphate and dissolved bones employed:—

	Superphosphate.	Diss. Bones.
Water	18.20	13.63
Organic matter	8.24	22.71
Soluble phosphates	39.30	8.41
Insoluble phosphates	1.64	25.17
Sulphate of lime	5.79	27.13
Sulphuric acid	19-57	—
Alkaline salts	2.93	1.58
Sand	4.33	1.32

There were six groups of trials made by Mr. Dove on turnips. The results of these I will place before my readers in a tabular form;

Group I. on Swedish turnips; the soil, a free clay, manured with 15 loads of dung per acre, and artificial manures in addition, worth 28s. per acre. The produce per acre is given in tons and cwts.

1. 2cwt. of guano	21	0
2. 3cwt. dissolved bones	22	2
3. 2cwt. 6st. dissolved bones and sulphate of ammonia mixed, 10 to 1	18	15
4. 4cwt. of rape-cake	20	12
5. Soil simple	17	5

Group II. on Swedish turnips; the same field as No. 1 group, with double the quantity of artificial manures, each worth £2 15s. per acre, but without any dung.

1. 4cwt. guano	22	10
2. 6cwt. dissolved bones	20	5
3. 5cwt. 4st. dissolved bones and sulphate of ammonia, 10 to 1	18	0
4. 8cwt. of rape-cake	19	10

Group III. on purple-top yellow turnip, on a strong clay soil, all dressed with 20 loads per acre of dung, and also the undermentioned artificial manures, worth 28s. per acre:—

1. Soil simple	9	10
2. 2cwt. guano	11	7
3. Dissolved bones	12	17
4. 2cwt. 6st. dissolved bones and sulphate of ammonia, 10 to 1	15	2
5. 4cwt. of rape-cake	13	2

Group IV. on white globe turnip on the same field as No. 3. series, dressed with 20 loads of dung per acre, and 28s. worth per acre of the following artificial manures:—

1. Soil simple produced	10	12
2. 2cwt. guano	12	15
3. 3cwt. dissolved bones	13	17
4, 2cwt 6st. dissolved bones and sulphate of ammonia ,10 to 1	12	7
5. 4cwt. rape-cake	12	2

Group V. on purple-top yellow turnip, on a poor light soil; dressed with 12 loads of dung, and 28s. worth of the following artificial manures per acre:—

1. Soil simple produced	9	5
2. 2cwt. guano	11	5
3. 3cwt. dissolved bones	11	5
4. 2cwt. 6st. dissolved bones and sulphate of ammonia, 10 to 1	13	0
5. 4cwt. rape-cake	10	2

Group VI., white globe turnip, on the same soil as group No. 5, dressed with 15 loads of dung, and 28s. worth of the undermentioned artificial manures per acre:—

1. Soil simple produced	12	7
2. 2cwt. guano	16	10
3. 3cwt. dissolved bones	17	0
4. 2cwt. 6st. dissolved bones and sulphate of ammonia mixed 10 to 1	15	10
5. 4cwt. rape-cake	17	5

The average result then of these six series of experiments on turnips was as follows, the produce in tons and cwts.:—

	Per Acre.	
Guano	15	17
Dissolved bones	16	4
Dissolved bones and sulphate of ammonia	15	9
Rape-cake	15	9

Much attention has of late been well bestowed on the growth of kohl-rabi, and as it possesses the very considerable advantages of thriving on stiff clay soils, and of withstanding the extremes of drought and frost, its cultivation will, in all probability, be steadily extended. Two papers on this root will be found in the last number of the Journal of the Royal Agricultural Society, by Mr. William Bennett, of Cambridge (vol. xx, p. 467), and by Messrs. Peter Lawson and Son, of Edinburgh (*ibid.* p. 497); and to these papers the attention of the reader may be well directed. The first question to which the farmer will require an answer is, as to the feeding value of the kohl-rabi. This inquiry is thus answered by Professor Anderson, who gives the following result of his analysis of its bulbs and leaves (*ibid.* vol. xx p. 523):

	BULBS.	LEAVES.
Water	86.74	86.68
Albuminous compounds	2.75	2.37
Respiratory principles	8.62	8.29
Fibre	0.77	1.21
Ash	1.12	1.45
	100	100
Nitrogen	0.44	0.38

Dr. Anderson appended to this analysis the following note to the Messrs. Lawson: "You will observe that both in point of composition and feeding value, the bulbs and leaves are quite identical. They are about twice as valuable as ordinary turnips, and materially surpass the best swedes, which rarely contain more than 9 or 10 per cent. of solid matters, and about 1.5 per cent. of albuminous compounds." Way and Ogston (*ibid.*, vol. xi. p. 511) did not find so large a proportion of ash in the kohl-rabi they examined as Dr. Anderson. Their analysis gives 0.95 per cent. of ash in the bulbs and 2.80 in the leaves. This ash was composed per cent. of

	BULBS.	LEAVES.
Silica	.82	9.57
Phosphoric acid	13.46	9.43
Sulphuric acid	11.43	10.63
Carbonic acid	10.24	8.97
Lime	10.20	30.31
Magnesia	2.36	3.62
Per-oxide of iron	.38	5.50
Potash	36.27	9.31
Soda	2.84	—
Chloride of potassium	—	5.99
Common salt	11.90	6.66

There are various points in the cultivation of this root which require attention according to the nature of the soil and climate; some of its growers, for instance, always drilling the seed on the ridge in the field; others as strongly preferring to rear it in seed-beds, and transplanting it like cabbages. Mr. Bennett is for drilling its seed;

he tells us that within the few last years he has abandoned the seed-bed, and drilled on ridges his general crop, on the fallows in May, using about 2 lbs. of seed per acre, at 27 inches apart, and thinning to 16 inches; he finds the seed extremely difficult to grow true, as it is apt to sport or be inoculated. Of the varieties generally sown he has a predilection for the *green* kind. In Scotland the time of drilling the seed is in April; and it would be difficult perhaps to give in other words a better digest of the chief facts relating to this valuable root than that given by the Messrs. Lawson. At the end of their valuable Essay (*ibid.*, p. 527), they observe:

1. There are eleven varieties in cultivation, four of which are supposed to be modifications of the others.
2. All soils are suited to its cultivation, but it prefers heavy lands, even those approaching to stiff clays, and it can be grown where turnips cannot.
3. Soil should be in fine tilth, well worked, and farmyard manure ploughed-in in the autumn. In the spring it should be grubbed and thoroughly pulverized.
4. It requires heavy manuring: phosphatic manures, with common salt added, are most suitable for it. Peruvian guano and other nitrogenous manures should be avoided.
5. Seed should be sown in beds at the end of February or early in March, in drills 12 inches apart. A bed 6 yards square will afford sufficient plants for one acre of land, and 8 oz. of seed will be necessary for the seed-bed.
6. For successional crops, three sowings may be made: the first, early in March; the second, during the second week of April; and the third, the first week of June.
7. Transplanting to the drills should be commenced the first week of May; but, as a general rule, the plants should not be removed until they are from 6 to 8 inches high.
8. Plants for the main crop should be dibbled in at 18 inches distance. If successional crops are transplanted, the first (in May) should be 18 inches, the second (in June) 16 inches, and the third (end of July or first week in August) 14 inches apart.
9. If sown at once in the field in the drills, the operation should be performed about the middle of April, but not later than the end. Of seed, 4 lbs. are necessary for an acre.
10. Drills should be 27 inches in width, and plants should be singled to 18 inches.
11. While growing, the horse-hoe must be kept in continual requisition, until the spreading of the leaves prevents the operation being performed.
12. The average weight per acre is, in England, from 26 to 30 tons; in Scotland, from 20 to 25 tons; and in Ireland, from 30 to 35 tons.
13. Every description of stock will eat the kohl-rabi with avidity. In consuming the crop, sheep may be folded on the ground; but, if given in the yards to cattle, the bulbs should be sliced or pulped. For pigs they should be steamed or boiled.
14. For cattle and horses it affords true nourishment when boiled with grain.
15. For milch cows it is invaluable, giving to milk or butter none of that disagreeable flavour which results when they are fed on turnips.
16. For ewes or lambs it is as fine food as they can have in March or April; and when the ewes are lambing it is found greatly to increase the supply of milk.
17. Kohl-rabi is, so far as at present known, subject to no diseases except "clubbing" and "anbury."
18. If hares or rabbits exist in the neighbourhood of the crop, they are sure to prove very destructive unless means of precaution are taken.
19. The leaves are of equal value with the bulbs in nutritive properties.
20. The plant for feeding purposes is twice as valuable as ordinary turnips, and materially surpasses the best swedes in point of composition and feeding value.
21. It bears transplanting better than any other crop, and is invaluable, therefore, for filling up blanks in turnips, swedes, or potatoes.
22. The kohl-rabi can withstand any amount of drought, if the operation of transplanting has been successful.
23. The most intense frost does not affect it; it stands the winter well, and affords good feed even to the end of spring.
24. Its advantages over the swedes are, that cattle, and especially horses, are fonder of it; the leaves are better food; it bears transplanting better than any other root; insects do not injure it; drought does not prevent its growth; it stores quite as well or better; it stands the winter better; and it affords food later in the season, even in June.

It is certain, however, that although the kohl-rabi on a clay soil thrives with the greatest luxuriance, yet it does well on the poorest gravels. It would perhaps be needless to refer to a much poorer black gravel than that of Spring Park, in Surrey, a farm once held by Mr. Hewitt Davis; yet here I saw this root for several seasons successfully grown; its mode of cultivation was described by him some time since (*Farmers' Almanac*, vol. iv. p. 25). His plan was to prepare a seed-bed by well digging and dressing in the winter a corner of an early piece of tares, sowing the seed in March thinly in drills 12 inches apart, keeping it clean by hand-weeding and hoeing, and then, as the tares were cleared off in May and June, the ground was deeply ploughed, dressed, ridged up, and planted. He found little or no advantage on the Spring Park soils from watering the plants even with dung-water; but this I take to be an exceptional observation. It would be well, I take it, in all cases, if the planting and watering could be performed in moist dull weather, or when the sun is about to set.

We may see, from these experimental inquiries, that the cultivation of our root crops has hardly yet arrived at that degree of general success which is yet attainable. Our knowledge of the manifold mysteries of vegetation is indeed still but very limited. The way in which certain root crops become so extensively diseased—the equally unaccountable manner in which the land refuses, after a while, however well farmed, to produce the same crop with its former luxuriance—are all matters needing the vigilant attention and study of the agriculturist and his helpmate the chemist. It would be well perhaps if, instead of devoting their exclusive attention to the explanation of the decreasing energies of some of our most valuable roots, the great scientific explorers were to search for other nutritious wild plants whose roots possess the power, like the kohl-rabi and the swede, of withstanding the extreme temperatures of our climate. Such plants would, in all reasonable certainty, by skilful cultivation, be very greatly increased in size, and be capable of vigorously withstanding for ages the perhaps too stimulating effects of high cultivation.

THE HERDS OF GREAT BRITAIN.

CHAP. XVII.

THE BROADHINTON HERD.

The first "fitful spring" morning of 1860 seemed to bid us be up and doing amongst the herds once more; and hence we were soon rattling along in the Great Western, towards the land of the Matchlesses and the gold-medal steers. The sight of the snugly-sheeted greyhounds which left the train at Faringdon-road and Shrivenham, to do battle for the Altcar Club against The World, was enough to woo us from our shorthorn allegiance, but we scorned to "droop and turn aside" like another Wild Dayrell, in their train to Ashdown, and held manfully on our line for Swindon. Mr. Stratton's residence at Broadhinton is fully seven miles from the station, and about half a mile to the right of the high road from Swindon to Devizes. The first part of the route lies through the Vale of White Horse, and when the Wroughton church hill is scaled, we are on the extreme edge of the Marlborough Downs, so renowned in the days of Teddington, and "the terrible Sir Joseph." A small white horse, which is anything but "a perfect form in perfect rest," keeps up, not the Epsom, but the old Saxon traditions of the district, on the side of the Hackpen Hills, under which, half hidden by trees, lies Uffington, that home of the improved Hampshire Downs; while, in the extreme distance, we can descry the Churchill monument, which marks the boundary of the Marquis of Lansdowne's property, at Calne. As we drew near Broadhinton the patient "pale faces," which are picked up each autumn at Hereford Fair, and passed on in due time to the Buckinghamshire graziers, lent some life to the landscape as they toiled along, six and four in a plough, with their white-smocked lieutenants at their side; but still that vast expanse of plough and down looked cold and dreary as the afternoon shadows chased each other across it, and away to the hills behind.

Mr. Stratton's holding consists of about eighteen hundred acres, part of it at Salthrop, some two or three miles from Broadhinton, where he settled in 1851. Both the farms belong to the Duke of Wellington, and about 700 acres of them are in down and pasture. Owing to the extreme moisture of the climate not an acre of barley is grown on them, and the wheat, in consequence of the lateness of the harvest, is of inferior quality. Sometimes half of it has been in the fields at Michaelmas, and the beans, which are then in full blossom, too often only ripen for the mockery of "a lost crop," with the frost. About 350 acres are laid down for hay each year, and 20 acres of roots, to wit, six of mangel, and fourteen of swedes are pulled up for the cattle; while the white turnips are eaten off along with clover and vetches by a flock of a thousand Hampshire downs, which Mr. Stratton purchases in the spring, and sells again in the autumn. He never breeds a lamb, and in fact it is as much as he can do with the aid of two of his sons, one of whom is quite a Herd "Book in breeches," to attend to his arable land and his 330 shorthorns. Every thing is on the same extensive scale, and out of about 100 work-people on the farm, 15 are kept solely for the herd. The bulls and bull calves are about fifty strong, and six of the former are in use at home, and three or four let for the season. The future steers, which are for the most part by Nottingham, begin to date from a week old. We saw nine or ten of them of all ages, but the steam plough, which knocked off twenty oxen and six farm horses, had thinned their numbers as well. Latterly Mr. Stratton has adopted the plan of working eight of his short-horn two-year-old heifers, which may be barren, or slip calf, or turn from the bull; and we found a pair of them, one by Hickory (14706), and the other by Lord of the Manor (14836), with blinkers and all complete, waiting to take a turn at the bush-harrow. They do their work quite as well as any Devon or Hereford. A Cornish man who was present rather disputed the point; but the retort was ready for him, that "perhaps he had'nt got the right sort of shorthorns." They are worked four in a plough, and six in a scarifier, from 7 to 4, with only half-an-hour's stoppage, when they are not hitched off, but merely chew the cud. During the summer and autumn they get nothing but grass, and then change to a little hay, wheat chaff, and bruised corn. The unpedigreed feeding steers are handed over at six weeks old to Mr. Stratton's father, who has a farm near Reading, and sells them to the butcher, when they reach a year and nine months. Cake, hay, and swedes is the bill of fare for those that remain; during their training they have seldom more than 9 lbs. of cake a day, and never above 12 lbs. at high pressure; but many get only 6 lbs. or 8 lbs. of meal, rye, and beans, instead. French and American cake is principally used, and the consumption is under 25 tons a year, as the dairy cows never taste it.

The sales average eighty year by year, and consist principally of young bulls, with yearling and two-year-old heifers. Many of the former are either sold or consigned to Australia; and Cornwall and the West of England generally furnish not a few purchasers to the Broadhinton mart. There are invariably 110 cows under tribute for the dairy, and the taste of a turnip is quite as strange to them as oilcake. The pails yield on an average about 300 gallons a day in the height of summer; and the mighty cheese tub made by Cockey of Frome, and worked on a new principle, can hold 200 cwt. at a time. Rather more than half a ton a week is turned out of it in summer, and the greatest part of it, along with the butter, which varies from 180 lbs. to 200 lbs. a week, finds a ready sale with a dealer at Windsor. An old horse undertakes the churning, but (tell it not at Warlaby!) Nottingham, son of Harbinger (10297), contemplates adding it shortly to his other accomplishments. The cows are kept in the fields during the grass months, and then come to "the stalls," which are neither more nor less than a large Lying-in Hospital, near the Salthrop dairy. The general practice is for the calf to suck a month, and then to have a gallon of milk twice a day for a fortnight, which is gradually decreased, and ceases altogether at the end of ten weeks, during the latter part of which, the vacuum, so abhorred by nature, is made up with hay and cake. No regular nurse-cows are kept, but of course the calves for letting or showing go on much longer, and we found three of them, Saladin, Athelstane, and Will-o'-the-Wisp, at five months, all in a row, and fairly jobbing their unhappy foster-mothers into the air with their efforts.

Amid such a mighty multitude of every age and sex, it must in the darker ages have required quite a weird-like sagacity to answer the question, "Who's who?" This, however, is effected very simply by the Radnor ear marks, which Mr. Stratton adopted from Mr. Moore, of Coleshill; but what with the nippers and the gimlet, some few of the ears seem to have had no sinecure of it. Considering the size of his herd, Mr. Stratton has had very few twins dropped, so far, and has never reared any, although Necklace and Bracelet from Queen Mab, (the former the more elegant, but not the thickest of the two), bid fair to live and flourish together. As regards colours, he has been able to form no decided opinion on the moot point, as to whether red on white, or white on red, is most likely to produce a roan; but he has frequently found the produce of two roans either white or red, which goes far to prove that roan will never, in spite of the care which has been taken to raise it to that dignity, rank, so to speak, among primitive cattle colours. His hundred-odd calves come very equal in sex, one year with another; except when cows are sent to the bull in a dry summer, and then there is a decided preponderance of bull calves.

It was during his residence at Calcott farm, near Cricklade, in 1838, that Mr. Stratton made his first pure shorthorn essay by the purchase of Phœnix (6290), from Mr. Mann, in Warwickshire, who had given his breeder Mr. Bellamy 20 gs. for him when a calf. The blood of his sire Shakespeare (581) went back in direct descent to Comet (155), and his dam Lady Byron, by Rockingham (more commonly known as "Jobling's Wellington") also bore affinity to Cripple, North Star, Danby, and other old Durham worthies. It was said of Rockingham that he earned a hundred a year for his owner during the fourteen seasons he was let. Mr. Stratton soon had a useful lot of heifers by Phœnix, the best of which, Moss Rose, was from a neat red and white heifer which he purchased in 1839, along with some others, in the Highworth market. This founder of the Broadhinton Herd, was born just before her owner removed to Wroughton, and was carried thither among his other household goods in a cart. The next calf from the Highworth heifer was made a steer of, and as Phœnix shortly after that ceased to get calves, he was sold for £40 to the butcher; and Lottery (4260), of Lincolnshire—Cartwright blood, and bred by Mr. Adkins, of Milcote, began to reign in his stead. He was put on Moss Rose, who had slipped calf to a Phœnix bull in the interim, and thence sprang Young Moss Rose, who was never quite so good looking as her dam. In point of breeding qualities there was little to choose, and they produced thirty calves between them. Moss Rose then bred a bull calf to Lottery, with which Mr. Stratton "drew first blood," as he sold it for £70 to his brother; and then came a white heifer by Corporal (6899), (a nearly pure Booth bull) and two others (one of them Ruby, dam of Waterloo (11025), by Kenilworth (7118), whom he purchased, together with Sir Thomas Fairfax (5196), from Mr. Parkinson, of Leyfields. Soon after this Mr. Stratton's eye fell in a lucky moment on Red Duke (8624), by Second Duke of Lancaster (5951), and with a strong dash of his favourite Jobling's Wellington to boot, in the bull-calf class at the Faringdon Agricultural Show; and he gave his breeder, Sir William Hayter, M.P., of St. Stephens voting lobby renown, £56 for him. The nick with Moss Rose proved thrice over a most happy one, and hence came Matchless 1st and Matchless 2nd, the dam of the Warwick cow, and Clarendon (12605), who was second to Lord Berners' bull for the aged prize at the Gloucester Royal. Third Moss Rose, who died on her way to Brazil, a white Tenantry heifer which never bred, but gained the first prize at Smithfield, and a red and white Fourth Moss Rose, were others of the old cow's progeny; her last calf, by His Highness, got smothered at her side, and she was one-and-twenty before the butcher came for her.

The Fates were alike propitious to the Young Moss Rose line; but strange to say, she owed her especial fame to a mistake of the herdsman, who put her to her sire Lottery; and Elegance, a nice stylish cow and a great milker, but not so massive as her dam, was the result. In due time, Elegance had four calves in succession by Red Duke, to wit, three Duchesses of Glo'ster, and First Duke of Glo'ster. The Second Duke of Glo'ster was from Young Moss Rose, but he died early, in consequence of the bursting of a vein under the arm, the hæmorrhage from which nothing could arrest. Salthrop Rose by Waterloo (11025) is one of the best relics of the same cow, and her last bull calf was Victory (17186) by Hickory (14706). Both son and sire were extensively used at Broadhinton, and then found favour in the Australian eye, as the one fetched 470 gs., and the other 600 gs., under the hammer there. Buckingham (15208) by His Highness followed them, with 400 gs. on his head. He was no show bull, but still very valuable in a herd, and although he left 70 calves behind him, Mr. Stratton has always regretted that he let him go. The Tortworth pastures also furnished a very capital heifer-getter in Hero of the West (8150) by Buchan Hero (3238), from Whitaker's Stella, but it is some years since he quitted Broadhinton, and he has just departed for "The Happy Pastures," without a tooth in his head at the ripe age of sixteen. Some of the best breeders among the cows must also be credited to Glanville (11535) by Waterloo, and his son Lord of the Manor from Matchless 1st. Mr. Sanday also furnished two sons of Harbinger, one of them the steer-getting Nottingham from Princess by Noble, of the old Mason sort, and the other His Highness from Lady Foggathorpe, a purchase at the Kirklevington sale. Latterly Mr. Stratton has "gone in" for Booth blood very decisively, but he has preferred purchasing from the adherents of Warlaby, to hiring bulls from there direct. Accordingly Settle furnished Charlemagne, or "Charley Mangey," as his guardian terms him, by Majestic dam by Royal Buck; and of three others which came from Mr. Barnes of Ireland, Sir Sam is let, Baronet, also by Sir Samuel (15302), is disposed of, and Young Windsor by Windsor (14013) is the Broadhinton premier.

Mr. Stratton's career as a prize-taker began in a very quiet way in 1837, at Devizes Show, from which he returned with six guineas for the best cow and heifer in milk, and that modest sum, multiplied by three, represented the whole of his achievements for the next three years. In 1841, however, he "got into good business on his circuit," which then comprehended only Chippenham, Devizes, Faringdon, and Wootton Bassett, and divers secretaries were laid under tribute for £25 5s. After this, his name became a familiar one in the lists at Cirencester and Bath; and in 1847 he came out from the ruck, and not only took the head bull prize of £20 at Gloucester, but won his maiden prize at Smithfield with a fat steer, the first calf that Hero of the West ever got, and born a month before his time. His winnings that year alone amounted to £135 15s., but the record has swelled with years into a green pamphlet, and the "sum tottel" now stands at £3,577 4s. in cash, exclusive of eight gold and twenty-one silver medals. Of this £80 and two gold medals were won in France, and £360 and 24 gold and silver medals at Smithfield and Birmingham. He did not try his hand at the Royal Agricultural until 1850, when the Society met at Exeter, but Matchless 1st had to bow, along with Col. Towneley's Alice and Beauty, to Mr. Wilson's far-famed Beauty of Brawith, in the two-year-old heifer class.

His ill-luck in the "land of red soil, red cattle, and red cloaks," as the American minister termed it, did not deter him from trying when the Society next came into his district, and at Gloucester, in 1853, his Mantle was second in the yearling heifer class. With Bridesmaid and Rose of Summer in the cow class at Carlisle, and Rose of Athelstane and Queen of May as the pick of the yearling heifers at Salisbury, it is not surprising that he should have failed to do more than return with such cold comfort as an H. C. and 5 Cs. The intervening year had, however, seen him second with his cow Marcia 3rd to Victoria 2nd at Chelmsford; two years after, Chester placed Matchless IV second to Nectarine Blossom, in a strong cow class, and there was a sound dairy look about her, which silenced all opposition, when the white rosette was found over her number at Warwick. Her daughter Matchless 6th was also highly commended in her class, and Magician got the second bull-calf prize, but had to give it up in consequence of an unfortunate mistake of a few days in his age, to Colonel Towneley's Bowbearer.

It is, however, as a breeder and feeder of Smithfield steers, that Mr. Stratton has won his especial fame, and the walls of his dining-room bear strong testimony, from the hands of Davis, Strafford, and others, to the lances he has broken with All England at the fat show jousts. Above the fireplace, in a group, are Third Duchess of Glo'ster (the venerable prima donna of Broadhinton) and a white steer by Clarendon (12605), on which Paris, Poissy, Birmingham, and Smithfield, all conferred first prizes and gold medals. Previous to her being fatted, the roan had bred one calf, and won the two-year old heifer prize at the Yorkshire Society's Show, with Matchless 2nd next to her. She then slipped twins by Hickory in August, and fed so quick in the next four months, that she made up to 80 score. In 1852-53, Mr. Stratton had quite a feast of fat things by Red Duke, as he owned the medallist in the ox class, and bred the winning steer (which he had sold to his brother Mr. Joseph Stratton of Manningford Bruce) as well. Two more of his own went up for their Smithfield degree the next year, and while the elder won the medal, the junior was made the medallist in reserve. In 1858, his steer by Nottingham, from a Red Duke cow, brought a third Smithfield gold medal into his collection, and left his hands, as he concluded, for a London butcher's, at £70. However, the new purchaser's idea of business was to raffle him in a lottery of 100 shares of a pound each, and the lucky drawer not knowing exactly what to do with his prize, offered him to his old owner for £50. He was accordingly brought home, and doctored on homœopathic principles with aconite; but although he grew considerably, and was fed on linseed with the oil in, he never quite recovered his handling, and after winning a prize at Birmingham, Rugby, and York, he was sold to a butcher at the latter city. It was an interesting feature about his Smithfield victory, that Mr. Brown of Uffcott (who was second to Mr. Fawkes of Farnley in the yearling bull class at Salisbury) won the gold medal for the best female with his Duchess, by Mr. Stratton's Waterloo. Another century may roll over the head of the Smithfield Club, ere two adjacent villages can make a like boast.

Having pretty well laid the ground-work for a monster survey, we commenced operations with the home yard, to which a picturesque little barn on staddles, full of Smithfield and Bingley Hall "ammunition," forms an appropriate portal. The yard itself is primitive to a degree; and some thirty cows and bull calves are ranged in thatched or slated sheds round it. Matchless 4th was there, and supposed to be in calf to Young Windsor; but although she is barely five, she will be prepared for shows no more. Now we cross the Manor Lees to the Manor Farm, and enter the great barn, to see what cards Mr. Stratton holds for December. They turned out to be two white steers by Nottingham, both very good, but vastly different in their character. One takes to the thing quietly, as if it duly felt its responsibilities, while the other with a most magnificent breast and forequarter, reminds one forcibly of a wild bull of Chillingham. A strong course of oilcake will no doubt tend to take the fire out of that tameless eye. There too was The Bee by Clarendon from a Waterloo cow, first at Cardiff, and highly commended in the yearling heifer class at Warwick. Breeding was not her mission, and her nice squarey level look, and snug forehand, and neat offal, all look hopeful for Christmas, if she will all go on as she has begun. Two steers for 1861 by Victory and Buckingham, and the former for choice, were feeding side by side in sheds hard by, along with one by Nottingham from a Nottingham heifer.

There was nothing in the Upper Waste except a pond shaded by ivy-clad trees, and some tumuli which mark the site of the old manor gardens. Every vestige of the Manor House has disappeared, and there is a legend that its royalist owner fired it with his own hand, to baffle the Ironsides. The ghost of this loyal torchbearer was seen to wander for years round the close, in silver buckles and a breastplate of fire. Twelve clergymen tried to lay him in the pond, but he would not stop there, and chose the Red Sea instead, where he is supposed to rest unto this day. Shaking off as best we could the effects of this fearful story, we traversed, in succession, the Cow, the Crab, and the Posted Lees. In fact, there seemed as many lees as signs in the zodiac, Then came Broadlees, once a sheepwalk, but now a pasture of eighty acres, with some fifty yearling heifers and late-calving cows in it, which resort on cold nights to a large straw yard called The Furze Farm, in one corner. We drew rein for a few minutes during our three miles ride, in the lane which led to the Salthrop Farm in order to have a look at the steam plough. It does its six acres per day in stiff, and eight in ordinary soil, with four shares. The coal delivered from The Forest of Dean costs £1 per ton, and it generally consumes 10 cwt. per day. Ploughing is, however, not the only use it has been put to, as Mr. Stratton attached a common mole plough to it by way of experiment, and drained several fields to the depth of eighteen inches. The labourers have no Luddite feelings with reference to it. They seem, on the contrary, to consider it more dignified to be engaged with a steam horse than one of hocks and hair, and ride up and down the field on the share frame, as if they quite loved the fun.

We did not touch at the Salthrop Farm Buildings at all, but wound our way through the wood and a pretty dell to the stalls and dairy. There the six-year-old Nottingham reigns and, supported by hay alone, leads a life of patient amiable industry, such as no bull living can match. There never was such a busy bee. Sometimes he is out in the bush harrow, and as he has also formed a working partnership with an old bay of apocryphal age, the two have made three ricks of stubble between them. In fact, in a dirty lane difficulty, they consider him equal to two horses and a half. His fine forehand and thighs strike you, in spite of his very low condition; but it is not until you have seen his collar and blinkers removed, and hung on a nail behind him, that you can compass the idea that he is a bull at all. Mr. Stratton has used him ever since he got him in 1855, with the exception of one season, when he was let to Mr. Moore, of Hanley; and, so far, there have been about 100 calves at Broadhinton by him. We missed several of the young bulls, whom we had seen the October before. Fairy King had gone to a Cornwall company; Athelstane to Mr. Coleman, near Calne; and Fitzjames by Hermit was let to Mr. Strickland, of Apperley Court, Gloucestershire, whose father was a purchaser of bulls from the Colings. The Duke of Cleveland (15925), from Daisy, and a complete union of Booth and Bates, through Duke of Buckingham (14428), and Cleveland Lad was also among the absentees, at Lord Willoughby's, of Compton Verney.

Duke Humphrey by Hermit, the winner of the second bull-calf prize at Warwick, had improved much since then. He is Moss Rose on both sides, and his deep flank, fine thighs, and expressive head, all strike one very favourably. There is a great deal of sweetness and placidity about the Hermit heads, which differ quite in their style from the Red Dukes', which are gayer, more prominent in the top knot, and with a good deal of white. Hermit did more for the herd than his sire Hickory, but he was sold to Australia for £200, and died on the voyage out. Hickory was principally crossed with Red Duke cows, and we found the last of his bulls in the shape of Hickory Nut from Chloe, rather strong in his shoulder-points, but a robust level fellow, who took our fancy not a little. Young Windsor, from a Hopeful dam, is also a nice-fleshed young bull, and they expect to have nearly 40 calves by him this season. He is white himself, and from light-coloured cows his stock invariably come white, but from red ones, a rich roan, with a white blaze behind the shoulder. They have broad backs and a very neat muzzle; and little Garrick from Actress, seemed the plum up to that point. Rhoderick is the only Buckingham bull they have now in use, and it was not a little unlucky that one of Mr. Stratton's customers at the antipodes should have wanted Booth blood, and made a tempting offer for his sire at the end of his first season. We found his dam, First Duchess of Glo'ster, with a newly dropped Young Windsor calf, looking quite the matron of the herd. She is a little rumpy from age, but still preserves all the frame and style that old breeders so love and long for. Broad heads seemed the peculiarity of a fall of Buckingham calves, nearly all of which have a peculiar curly love-lock, just under the ear. Marc Antony by Marcus (a son of Hickory and Marcia 3rd), is intended, along with Duke Humphrey, for the yearling bull class at the Royal this year. The former will fight at a great disadvantage, in consequence of being such a late calf; still he is a nice level little fellow, with a capital light roan coat on his back, and rather like Royal Butterfly about the head. His grandam, Marcia 3rd, won some fifteen times, beginning as a yearling; but she never lived to see her new American home in the "blue grass region," or wherever it might be, as the ship ran foul of another, and stove her berth in so completely that she got loose and broke her leg in the confusion.

The cows seemed to be composed principally of Hickories, Tenantries, Red Dukes (many of them red, with a blaze of white on the thigh), and Waterloos. To begin with the former: we had Sylvia, a neat own sister to Hickory Nut; Primitive, and Miss Prim, a gay little cow, own sister to the gold medal steer, from Red Prim. Her last bull-calf has just been sold to Mr. Bartholomew Horsell, of Rhabson, who breeds entirely from Mr. Stratton's tribes. Sultana 2nd, by Hickory, from Sultana, had the first prize at Cardiff the year before last, and the champion Oxfordshire prize the same season as the best in the yard at Banbury. She is going to the Royal; but although there is a good deal of substance and sweetness about her, she seems hardly big enough. There was also Harmless 3rd, the first of the Hermits, and Michaelmas Rose by the same bull, and the last of Young Moss Rose's produce. Old Moss Rose's last was there, in the shape of Matchless 5th by Hickory, the dam of the yearling Matchless 8th by Buckingham, which certainly does not look advanced enough for Canterbury. Matchless 6th is the first daughter of the Warwick cow, and does her ample justice with her nice flank, good back and breast, and neat offal. In her head she slightly resembles her mother, and has more of the Booth character, which she gets through her sire, Hickory. She was born a little before her time, and had to be kept for some days in blankets. At Worcester she had a first prize, and was highly commended at the Royal; but a year with Faith, Maid of Athelstane, and Duchess 77th in it is tremendous, and they do not intend to go on with her. Gazing at us among a group of twenty calves, nearly all Buckinghams or Hermits, in a straw yard, was her second calf, a white heifer by Victory; her third, a robust-looking bull-calf by Nottingham, was a few sheds from her in the home yard; but the fourth essay has been made with Young Windsor. Matchless 3rd was twice over placed second to her dam Matchless 2nd, as dairy cow at Worcester, two years before she gained her second prize in Rose of Towneley's class at Smithfield; but Matchless 4th had to bow to her at Cardiff. The latter is only a little past five, and has won ten prizes in all; her peculiar Roman nose, great width of back, large bag, and Bridesmaid sort of breast, all contribute to make her a remarkable cow; and we can hardly wonder that she has twice over achieved such high Royal honours.

The Tenantry cows were, as a tribe, remarkably large and roomy. Clove, with her fine slashing frame, looks exceedingly well in the pasture, though she may be a trifle big in the hips. Satin and Landlady also took our fancy; but the latter is not so neat in her rumps as she is in her neck. Then came Sunset, a hardy style of cow by Nottingham; and her half-sister Actress, with a neat forequarter, and compact altogether, and highly commended in the dairy class at Warwick, while Blossom and Lizzy were the second pair in the dairy class at Chester. The latter is not unlike, but rather bigger than Rose of Sharon, and up to twenty-four quarts of milk a day, at the height of the grass. We looked more at Whinny by Red Duke, from admiration for the Nottingham steer calf at her side, which is to be prepared for '62; but old Buttercup, another of the Red Dukes, and the dam of Satin, seems to be wasting away. In her prime, she has always been a wonderful milker, and, with the exception of one week, she went on for three years without a break. Red Rose must certainly not be forgotten; and Salthrop Rose by Waterloo, from Young Moss Rose, was rather a striking cow, somewhat like the Aylesby Garland in her colour, and stylish in her head. Miss Glanville 2nd by Waterloo was also big and full of character; and both Cleopatra 2nd by Waterloo, and her daughter Elegance by His Highness, were of a smaller, but a very neat stamp. The former is a great granddaughter on both sides "to the old cow," as they fondly term Moss Rose, and has been known to give her twenty-eight quarts a day. As far, however, as looks go, His Highness had done more for his royal name with Essence of Roses, a nice level, elegant cow, and with better crops than almost any we met there. She had just calved to Young Windsor, so that we did not see her to much advantage. They quite hope to go on with her for the Yorkshire Royal next year; and there is nothing in his herd that Mr. Stratton seems to fancy more. With her, our second day's inspection ended, as we thought, and we were more astonished than delighted to hear suddenly from our guide, that he had absolutely "forgotten a field with 29 calves in it." Beef, milk, and veal seemed a perfect drug, and like the linguist who proposed to talk a little bad grammar by way of relaxation, we could gladly have recruited our thoughts for an hour or two among silkworms and dragon-flies. Luckily Ashdown was not far distant, and ere long we had changed the *venue* from the Red Dukes and the Waterloos, and the cheese-room, to the Rosy Morns, and the Sweetbriars, and the straight-backed hares of the far-famed Compton Bottom.

H. H. D.

TOP-DRESSINGS FOR PASTURES.

SECTION II.—ANIMAL MATTERS.

1.—FARM-YARD DUNG

is composed of straw mixed with the solid and urinary excrements of animals. The unequalled value as a manure arises from the quick organic matters in the urine; in which are found, as the products of change, the more valuable organic and inorganic ingredients, while the invaluable substances are found in the fæces, which are characterized by the earthy salts, as is the urine by the alkaline salts. The soluble mineral ingredients are contained in the urine, in addition to the nitrogenous or ammonia-forming ingredients. The solid fæces represent the incombustible ashes, or the "debris" of food, as combustion accompanies nutrition by the decomposition of the articles used to support life. The mineral ingredients form the source of action of solid fæces as manure. Straws contain a large portion of silica, with earthy phosphates and carbonates and soluble salts. The gradual decomposition yields an earthy residuum, which adds to the staple of the land. The earthy matters enter into combination with the animal and more easily soluble ingredients, retard the too rapid putrefaction, and confer the lasting quality on farm-yard dung as manure.

Farm-yard dung is best applied in the unprepared condition of straw and excrements, as produced in the dung-yards. It is most beneficially used in the latter end of autumn or in the early winter, and by the time the grass shoots in the spring, the fæces will be much decomposed, and will have subsided into an earthy stratum that hold the roots of the plants, the strawy part will have afforded shelter and warmth to the vegetable layer, and when the vivifying heats of spring commence, the effects will be protruded with much vigour. In the early spring, any roughness that remains on the surface must be raked off, and a heavy roll will level the inequaliities, and press to the roots of the plants the earthy decomposition of the fæces from the effects of the action of the vicissitudes of weather. The quantity of dung laid on the ground must cover the surface evenly and closely when spread by the fork, and care is used in breaking the lumps and laying the materials very evenly over the ground, and when the strawy covering is removed in the spring, the combinations that have been forming during winter are ready for development in the promotion of vegetable growth. New seeds intended for hay are wonderfully benefited in this way. As the excremental part of the manure contains an earthy residuum, the seeds of the better grass plants are very beneficially sown in the spring, and rolled into the ground. All pastures are with certainty improved by this application; inferior grounds are advanced in a full fourth of the herbage, and always with the never-failing effect of weeds being banished, and grass plants brought forward. Top-dressings of any kind produce this effect; but calcareous matter and farm-yard dung are the most prominent actors in that way.

2. BONES

are the walls of the animal habitation, and are chiefly composed of phosphate and carbonate of lime, with magnesia, soda, and potash; cartilage completely soluble in water. The reduction is effected by crushing mills, and into a finer condition by acids, which confer new qualities and form fresh substances. Half-inch bones are the most common in use, and with the dust that is produced by the grinding. In this comminuted state, the bones are spread over pasture lands at the rate of one to two tons per acre, and cost £3 to £4 per ton; and the application is done in October and November, and also in April. The surface of the ground is well harrowed before sowing the bones, and afterwards brushed and rolled. Moist weather is preferred. In many cases, the quantity of herbage has been doubled or very largely increased; and the effects are very lasting, even to twelve years when the land is pastured. When mown, four or five years exhaust the application. The calcareous element in the bone very much encourages the growth of white clover, as in all cases of similar substances being used. On clovers and seeds the effects of bones are very large with 1½ tons on an acre, and last for several years. The liking for dry lands attaches to bones in every case of use.

3. GUANO

is the accumulated excrements of sea-birds which roost on the islands of the southern ocean, and drop the dung in layers on the banks of rock that guard the ocean. The composition is very varied in salts of ammonia, acids, lime, sand, potash, soda, water, and organic matter. The value rests on the ammoniacal ingredients. The use of guano for growing turnips is well known; the quantity of 2 cwt. sown on an acre of meadow land has increased the crop of grass half a ton per acre, and pasture grounds have been proportionally improved. The best experience recommends mixing the guano with fine earths and sifted ashes in equal quantities, and that the spring is the best season of application.

4. NIGHT-SOIL,

or human excrements, is a very rich fertilizer, and highly appreciated. Water forms three-fourth parts; one-sixth part is animal products, and slight traces of bile, albumen, soda, magnesia, and lime. The substance is mixed with earths, peat, mould, and coal-ashes, which imbibe the liquid part, and convert the ordure into a dry compost, which is spread on any grass lands with a large effect. The quantity is the common allowance of the light earthy composts used in the spring. The small quantity of night-soil seldom extends to the farm, being applied to the garden purposes.

5. PIGEONS AND POULTRY DUNG.

The dung of pigeons is of a very powerful nature, but very hot and stimulating, and abounds with the volatile alkaline principle. Is contains uric acid, and gives by distillation carbonate of ammonia, yields soluble matter in water, and is very liable to ferment. It also possesses an acid of a peculiar nature, which increases when the matter is diluted with water; but gradually gives place to ammonia, which is at last abundantly exhaled. It affords carbonate of ammonia, and leaves as a residuum carbonate of lime and saline matter, chiefly common salt. The dung of poultry contains silica, carbonate and phosphate of lime, and, along with the dung of pigeons, is mixed with earths and ashes, and applied as top-dressing in the usual method and quantity. The preparation of the compost must be minutely performed, and very intimately blended, in order to prevent the fiery and corrosive fermentation of the excrements, and to destroy the clinging together of the poultry dung. The quantity is small of these excrements that come into the hands of the farmer—the readiest application will be to spread the materials evenly on the top of a dung heap, just before being turned over, which will mix the substances and extend the benefits equally. But when a quantity is found that justifies the preparation of an earthy compost, a top-dressing of great efficacy may be obtained. The excrements of winged animals are to be used fresh in the mixture, as the fiery nature wastes the substance and corrodes the residue.

SECTION III.—SALINE SUBSTANCES.

1. SALT.

Common salt is the muriate of soda, or chloride of sodium, and contains

Sodium	39·66
Chlorine	60·34
	100·00

It is found in mineral deposits as a rock in sea water, and in many saline springs. Earthy impurities are found in salt, as salts of magnesia and lime: it is a promoter of vegetation in certain cases—an excess of it destroys organic life, and the effects hitherto are not large enough to encourage the use of the article. The deliquescent nature of salt very quickly dissipates the substances, and it is preferred to mix it with earths, and to apply the compost on grass lands at twenty loads to an acre. The quantity of twenty bushels of pure salt has been fixed as a proper quantity for top-dressing an acre of pasture in spring or in autumn. Saline manures require to be used on a moist surface of ground, and with warm weather.

2. NITRATE OF SODA

is the fossil alkali in combination with the nitric acid, and contains—

Acid	62.1	62.5.	62.81
Base	37.9	37.5	37.19
	100.0	100.0	100.00

It was formerly called cubic nitre, and occasionally mentioned by the chemical writers of the last century. It is more bitter than nitre, has a cool, sharp taste, crystals very transparent, soluble in three parts of water, and in less than its weight of boiling-water; exposed to the air it attracts moisture, and in the fire resembles nitre, except in not melting so easily. Specific gravity, 2.0964. It is found in the East Indies and in Peru, whence the chief supply is derived. It is principally used in preparing nitric acid, the deliquescent quality rendering it unfit for use in the composition of gunpowder. The stratum is found below the surface on the edges of a plain of vast extent, and in a nearly pure state. It is also an artificial salt, and may be formed by a combination of its constituents in a direct solution, or by mixing the nitrate of lime and the sulphate of soda together, filtering the solution, and evaporating.

The most recent character of nitrate of soda finds the substance to be very deliquescent in moist air, attracts much moisture, and dissolves in twice its own weight of water. It contains—

Soda	36.7
Nitric acid	63.3
	100.0

It has proved the most effectual and generally useful of all saline manures as a top-dressing on young crops of grains and roots. One bushel mixed with two bushels of common salt is the most approved mode of application. The price is about 16s. per cwt., and is sown by hand in the spring after being pounded into dust. The effect on grass lands has increased the produce by one-third and one-fourth, and well repays the expense; and best used after gentle warm rains, followed by heat,

3. NITRE,

or saltpetre, is the nitrate of potass, a native mineral that occurs in all the four quarters of the globe. The average constituents are—

Acid	44.0 and	31
Potash	51.8 and	61
Water	4.2 and	8
	100.0	100

The use of nitre is very large in the composition of gunpowder, and also in medicine, and many of the arts. Specific gravity, 1.920 and 1.9369. The ancients confounded nitre with soda or natron, and leaves us in doubt whether or not they knew nitre; but it was known to Bacon, in the thirteenth century. Nitric acid is one of the most powerful acids that is known, and constituted of nitrogen and oxygen in a peculiar proportion to each other—about 70.5 of oxygen and 29.5 of nitrogen.

Pounded nitre has been sown by hand as a top-dressing on various crops, and with very fair success. On grass lands nitre increased the quantity by one-third, and the herbage was much earlier. The effects are hardly equal to nitrate of soda from equal quantities of the two articles; and nitre being much dearer, the superior merits belong to nitrate of soda.

4. SULPHATE OF POTASH.

Sulphate of potash contains

NEUTRAL SULPHATE.		ACID, OR BISULPHATE.	
Potash	54·08	Potash	34·65
Sulphuric acid	45·92	Sulphuric acid	58·74
Total	100·00	Water	6·61
		Total	100·00

Sulphate of potash is high in price, and few trials have been made with it. The bisulphate is lower in price, and a by-product of several chemical works, and is a strong fertilizer, though no precise experiments have been recorded.

5. SULPHATE OF SODA.

Sulphate of soda is formed of soda and sulphuric acid in nearly equal parts. It acts well as top-dressing on grain crops, and on roots, and on grass lands where the return paid well for the expense.

Sulphur is supplied to growing plants in order to produce a healthy condition. Plants contain sulphur in different quantities, and will be unequally affected by the application of sulphates, the greatest benefit being derived by those which contain most sulphur. Potash and soda are furnished to the plants, without which no perfection is attained, soda being more abundant in soils than potash: the latter application in the sulphate may be proved the most beneficial.

6. Sulphate of Ammonia.

Sulphate of ammonia contains

Ammonia	25·8
Sulphuric acid	60·6
Water'	13·6
Total	100·0

The salt has been found very serviceable on all corn crops and on grass lands: the bulk and quality have been largely increased. It is a highly forcing manure, and is beneficially mixed with common salt, which mitigates the energy, and by diluting them, the spreading is more even over the land. One and a-half cwt. of sulphate of ammonia is a good dressing for an acre of land. These salts afford nitrogen to the plants, which is yet unknown if best in the form of ammonia or nitric acid, or in the form of nitrogenized ammonial or vegetable matters.

7. Superphosphate of Lime.

Superphosphate of lime is manufactured from bones by the action of sulphuric acid after the bone has been crushed and pulverized. The acid operates in rendering more soluble the phosphate of lime or earthy salt, which composes the hard texture of the bone, and imparts the rigidity. The composition is given by an eminent analyst:

		Per Cent.
Moisture		9·00
Organic matter		17·13
Silica		5·60
Soluble phosphate		11·63
Neutral phosphate	18·15	
Insoluble		12·33
Hydrated sulphuric acid		44 05
Free sulphuric acid		0·26
		100·00
Bone phosphate made soluble		18·15
Bone phosphate made insoluble		12·33
Total phosphates		30·48
Nitrogen (equal to)	1·06	
Ammonia „	1·28	

Bones in the form of superphosphate are very quick and powerful in raising turnips, and are proved to be one-fourth more energetic than the half-inch bones with the dust made in grinding. The same result attends the use of superphosphate as a top-dressing, being spread over the surface of the ground as in the case of common bones. No more energetic manure has yet been found. The price is £5 10s. per ton.

Muriate of potash may be reckoned a powerful manure, as the substance is very abundant in the vegetable world, but no records have been made of any fair experiments and authenticated results.

THE VINEYARDS OF LA BELLE FRANCE.

While deputations from the British wine merchants, or rather manufacturers, are waiting upon Mr. Gladstone, and the makers and vendors of "Publican's Port" are getting up sympathy meeting, and a certain party in Parliament is trying to overthrow another party, with a view to reinstate the first party, and thus benefit a party abroad, who is now in a very bad state of health, we will, if you please, take a trip to the vineyards of La Belle France.

Commencing with the most northerly, it will be necessary to take our tickets to Epernay. This is on the line of railway—constructed, I believe, with English money, as nearly all the continental railways are—from Paris to Strasbourg, which answers to our Eastern Counties. Starting from the splendid terminus, Place de Strasbourg, we pass from the north side of Paris, and soon arrive at the orchards and gardens of Lagny, on the left bank of the Marne. Twice crossing this river we arrive at Meaux, a large city, with 8,000 or 9,000 people, and catch a glimpse of the stately Cathedral of St. Stephen, and whirl past the avenue of yews, where the learned Bossuet was accustomed to meditate undisturbed by the shrill whistle and whir of the railway train. The water-mills on the Marne are always going, to supply Paris with flour, and the land around is productive. The dairy-maids, too, make a very delicious cheese, called *fromage de Brie*. Rattling through the tunnel of Armetiers, we pass La Ferte-sous-Jouarre, celebrated for the best millstones in the world, cut out of a silicious rock, known as burr stone, forming the uppermost stratum of the fresh water basin, in which Paris is placed. Blocks are extracted in cylinders; but the stones are usually made of bits, bound together with iron. Some 1,200 pairs are produced annually. A good stone, 6½ feet in diameter, costs about £48. The river here is varied by islands, one holding the half-ruined Castle of La Barre. All along to the Château Thierry Station, the banks of the Marne are very pretty, and the surrounding country shows that the farmers are awaking. This old town has a battered look, and reverting to the campaign of 1814, the mind's eye recalls the hoards of Calmucs and Cossacks that occupied the Plain of Brie. We have just time to notice the picturesque castle built by Charles Martel, for young King Thierry IV., upon the summit of a pleasing slope, before the railway crosses the Marne for the eighth and last time, and we break away into the prettiest part of the ancient province, of Champagne, the country of the champagne wines. Passing Dormans, the birthplace of Pope Urban II. and Port à Binson, where is visible the gothic castle built by Madame Clicquot ("the mother of wines") we come to the head-quarters of Vins de Champagne, namely, Epernay, and are now about 80 miles from Paris. Making a pleasant trip to Rheims, a little to the north, where the banks of the Vesle are surrounded by slopes covered with vineyards, and then to the Hill of Aï, or the Marne and Hautvilliers, Dizy and Avernay, making all imaginable inquiries in rather feeble French, whenever it is possible, we obtain certain dis-jointed facts, which digested, group themselves into something like the following order:—

These Champagne wines are divided into Vins de la Rivière, and Vins de la Montagné, the former, or those produced from the lands in the valley, being the richest. They occupy a tract of country about five leagues in extent.

It must here be remarked that position and aspect make a prodigious difference in the yield of the vine. In the slope of a hill, from the top to the bottom, there will often be three different sorts of wine. The best and most favourable aspect for a vineyard is upon a rising ground facing the south-east. And thus we usually find them situated. The vine grows in every soil; but that which is light and gravelly is best adapted. The debris of granite rocks, and beds bearing marks of volcanic action, are peculiarly favourable to its growth. Here we find a thin calcareous soil. The vines upon these slopes remind us of Kent, where poles are used to support the hop; for, in consequence of the cold and wet weather often prevalent at this latitude, they are not allowed to trail upon the ground as they do in the south, to prevent evaporation of moisture from the soil.

The vintage commences when the leaves begin to fall, and the juice is sweet, bland, thick, and clammy. The fruit is usually gathered before the sun has risen, by which means a briskness is given to the wine, and its quantity is increased by 1 in 24. A sufficient quantity of fruit is gathered in a day to fill one vat, so that it may all ferment equally; and this gathering is performed by women with scissors, cutting the ripest bunches and mixing with them a small proportion of the slightly unripe berries. For the red vins de Champagne the fruit is gathered dry after the sun has risen. And now commence the labour and the risk which raise the price of these wines so high, irrespective of duty. The fermentation of those intended to be brisk and sparkling is very tedious. The liquid or *must* is soon passed from the vat into the cask. And while in cask those wines obtained from the first, second, and third, or final pressure of the fruit, and known relatively as *vins gris*, *œil de perdrix*, and *vins de taille*, which are most coloured, are mixed together. Thus when the *vins gris* has fermented in casks ten or twelve days, the bung holes are closed, and spigot holes are left, through which the casks are filled up from time to time with the other varieties, upon a systematic plan. Wines bottled any time between the vintage and the following May will be sparkling. They begin to sparkle after having been six weeks in bottle, and the mountain sorts earlier. Bottled in June they will sparkle but little, and bottled so late as October they will acquire the condition termed *still*.

Being in bottle a second fermentation is induced, by putting into each bottle a small glass of what is called *liqueur*—sugar-candy dissolved in wine, and fined to brightness. "This fermentation produces a fresh deposit of sediment. In this process the greatest attention is requisite, and the bottles are closely watched, the temperature of the air carefully regulated, to promote or check the fermentation; yet thousands of bottles explode—so many that 10 per cent. is always charged as a cost of manufacture." This is particularly the case in seasons of great and sudden heat. In April, 1843, Madame Clicquot, the largest grower in France, lost 25 per cent., or 400,000 bottles, before fermentation could be reduced by large supplies of ice.

"After clouding with fermentation in the bottles, the wine begins to deposit a sediment, and the bottles are placed with their necks downward on long shelves, having holes obliquely cut in them so that the bottoms are scarcely raised. Every day the attendant lifts the end of each bottle, and after a slight vibration replaces it a little more upright in the hole, thus detaching the sediment from the side, and letting it pass towards the neck of the bottle." This process is continued until all the sediment has gravitated to the neck. Then a man takes the bottle, holds it steadily, mouth downwards, to a recess prepared for the operation, cuts the wire, and away goes the cork, and sediment, and part of the wine. But to conduct this operation with anything like economy, a quick hand is needed to replace an old cork, with as little loss of time and wine as possible. The bottle is filled up with purified wine and again stacked, to be submitted to a second disgorgement, and sometimes a third. It is then fitted, by another dose of candy prepared in white wine, for any particular market, which imparts a pleasant sweetness, and aids its sparkling condition when opened. Thus every bottle passes through the workman's hands 200 times before the wine is perfectly cleared.

The demand for this class of wine has so much increased latterly, that we now are introduced to various imitations, in sparkling Hock, Burgundy, and Moselle. And even here we do not escape adulteration, for at Cette and Paris are manufactories, where poor light wines are fined with candy, and passed through an apparatus that charges them with carbonic acid gas.

Respecting the quantity that is made, the genuine production of these Champagne districts exceeds fifty millions of bottles, and the price at Epernay being from 2 to 3 francs, or 1s. 8d. to 2s. 6d. per bottle, supposing the duty here to be 3s. per gallon, or 6d. per bottle, and the carriage, and wine merchants' profits amount to 1s. per bottle, we shall find the genuine article upon our tables at something like 4s. per bottle.

It is, however, proposed to vary the duty according to the strength of the spirit in any given wine, and as champagne has but a small proportion of alcohol, it will be probably introduced into this country after the 1st of April, 1861, at a charge of 1s. per gallon, instead of 3s., as it stands upon Mr. Gladstone's improved tariff.

The lion of the neighbourhood is to be seen at Challons-sur-Marne, a town with 14,000 inhabitants, a little higher up the river than Epernay—I mean M. Jaqueson's champagne cellars. They are plainly visible from the station, and a little on the right. It is said that the French Government hired his cask and packing shed for six months to barrack 4,000 men. That gives you some idea of their space. Here you generally will find four millions of bottles, ready for sale. They are deposited in galleries, excavated in the chalk rock, about six miles long, intersected by tramways communicating with the railways, and perfectly lighted by metal reflectors, placed at the bottom of the air-shafts.

Our good teetotal friends, people with excellent intentions, will be somewhat scared by this vision, more scared even than the extinct disciples of that school who some years back beheld blessing in sterility, ruin in fertility, and who accustomed themselves to lament about "superabundance of production."

Cheap wines will be more effective than temperance pledges; and, Christian though I am, I very much incline to the idea of a Heathen poet, who has elegantly represented wine as a recompence given by the Deities for the misery brought upon mankind by the general Deluge.

Bring forth the taper-necked bottle, fill a bumper, and let us drink to the future vintages of the Marne.

F. R. S.

A WRINKLE FOR FARMERS.—When any of your cattle happen to get swelled with an over-feed of clover, frosty turnips, or such like, apply a dose of train oil, which, after repeated trials, has been found to prove successful. The quantity of oil must vary according to the age and size of the animal. For a grown-up beast of ordinary size the quantity recommended is about an English pint, which can be administered readily enough, taking care at the same time to rub the belly well, in order to make it go down. After receiving this medicine, the beast should be made to walk about till such time as the swelling begins to subside.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A Monthly Council was held on Wednesday, April 4th, Lord Walsingham, President, in the chair. Present: Lord Tredegar, Sir Watkin W. Wynn, Bart., M.P.; Sir John Villiers Shelley, Bart., M.P.; the Hon. W. G. Cavendish, M.P.; Mr. Amos, Mr. T. Raymond Barker, Mr. C. Barnett, Mr. Barthropp, Mr. Bramston, M.P., Colonel Challoner, Mr. Exall, Mr. Brandreth Gibbs, Mr. Hamond, Mr. Howard, Mr. Fisher Hobbs, Mr. Wren Hoskyns, Mr. Hudson (of Castleacre), Mr. Humbertson, M.P., Mr. C. Lawrence, Mr. Pain, Mr. Shuttleworth, Professor Voelcker, and Mr. Jonas Webb.

The following new members were elected :—

Arkcoll, Thomas, Langley, Eastbourne.
Arnold, Rev. Richard Aldous, Ellough, Beccles.
Bigge, Charles Selby, Linden, Morpeth.
Bosley, John, Lower Leyde, Hereford.
Cadle, Clement, Ballingham Hall, Ross.
Carnegie, David, Eastbury, Watford, Herts.
Chinnery, John, Woolton, Milton, Lymington.
Clayton, John, Hook, Kingston, Surrey.
Hay, Charles Anderson, York Terrace, Regent's Park.
James, James William, Mappowder, Blandford.
Johnstone, John Cartledge Hirst, Hardwicke Hall, Castle Eden, Durham.
Kearsey, Charles, Glewstone, Ross.
Keep, Richard, Aldermaston, Reading.
Lay, John Watson, 3, Savage Gardens, Tower Hill.
Martin, Edward Hall, jun., Barr Hill, Madeley, Staffs.
Miller, Seymour, Bradpole, Bridport.
Murton, Frederick, Smeeth, Ashford.
Neate, John Reeks, Northington Farm, Overton, Hants.
Prodgers, Herbert, Ayott Rectory, Welwyn.
Rigg, Joseph, Fillougley, Coventry.
Sladen, Joseph, Hartsbourne Manor, Bushey.
Smith, Felix, Upton Bishop, Ross.
Snowden, William, Longford, Gloucester.
Taylor, Robert Parker, Adelaide Place, London Bridge.
Tindall, Frederick, Preston, Faversham.
Tomlin, J. Currer, Manchester.
Towell, Samuel, Rutland House, Newmarket.
Wigmore, John, Weston-under-Penyard, Ross.
Woolf, Thomas, Standon Hall, Eccleshall, Staffs.

FINANCES.—Mr. Barnett, Chairman of the Finance Committee, presented their report, by which it appeared that the current cash balance in the hands of the bankers was £4,926 18s. 2d. The Secretary's receipts during the past month had been duly examined by the committee and by Messrs. Quilter, Ball, and Co., the professional accountants.

IMPLEMENT COMMITTEE. — Colonel Challoner, chairman, reported that they had had an interview with certain implement makers who requested information as to the conditions stated in the Prize Sheet under Art. 3, and who were informed that the combined finishing machine does not come within this year's Prize Sheet, as settled by the Council in 1858.

CANTERBURY COMMITTEE. — Mr. T. Raymond Barker presented the report, which recommended an alteration in the mode of printing the Catalogues, and that the Implement Catalogue be charged at 1s. 6d. each.

The Secretary was directed to write to the Local Secretary, pressing him to carry forward the construction of the approaches to the Show Yard.

On the motion of Mr. Brandreth Gibbs, seconded by Mr. T. Raymond Barker, the subject of the visits of the Veterinary Inspector was referred to the Veterinary Committee, with a request that they will report whether any alterations can advantageously be effected whereby more numerous applications for his services would come from members of the Society, as suggested in the report from the Governors of the Royal Veterinary College.

On the motion of Mr. Hudson, seconded by Mr. Hamond, Dr. Augustus Voelcker, Consulting Chemist to the Society, was unanimously elected an Honorary Member of the Society.

Memorials, accompanied by pressing and cordial letters from the authorities, were received from Doncaster, Harrogate, Hull, Leeds, Wakefield, and York, on the subject of the country meeting to be held next year in Yorkshire. An Inspection Committee consisting of the Hon. W. G. Cavendish, M.P., Sir W. Wms. Wynn, Bart., M.P., Mr. Brandreth Gibbs, Mr. Fisher Hobbs, and Mr. Milward, were appointed, with a request that they would visit the proposed sites and report on their suitableness or otherwise for the purposes of the Society by the next Monthly Council.

A copy of the Magnetical and Meteorological Observations made at the Observatory in Bombay during the year 1857 was received from the Secretary of State for India in Council, and ordered to be placed in the library.

The current numbers of the Society's Journal were directed to be sent to the Agricultural Society of the State of Wisconsin, in exchange for the Transactions of that body.

Leave of absence was granted to the Secretary for a week.

The Council then adjourned over Easter week till their Weekly Meeting on Wednesday, the 18th April.

AGRICULTURE IN AUSTRALIA.

Agricultural—or rather perhaps pastoral—operations in Australia seem about to undergo a change. Everyone must be familiar with the "rendering down" of sheep and beeves for the sake of the tallow, the flesh being thrown away as valueless. Where the animals can be got to market, that is to say where the localities in which they are raised are not wild and inaccessible, they will now be no longer contemptuously cast aside; on the contrary, the probability appears now to be that they can scarcely be produced in sufficient numbers to meet the demand.

In New South Wales the population is still sparse and scattered, but in Victoria it is marching on with astounding rapidity. The little despised settlement of Port Philip, which in 1850 could boast of only 25,000 or 30,000 inhabitants, has in 1860 expanded into a community of between 500,000 and 550,000 souls; and the smiling wilderness, with which Sir Thomas Mitchell was so pleased in 1835 that he styled it "Australia Felix," has justified the prescient anticipations of that able officer by becoming the home of thousands and a resort of all nations. Men must eat, especially gold-diggers with money burning in their pockets, and the consumption of animal food in Victoria is consequently becoming enormous. A vicious land system and a comparatively limited territory render it impossible, probably, to keep pace with the wants of a population which advances at the rate of 30,000 or 40,000 a year; and hence the eyes of the hungry multitude have, since 1852, been turned in the direction of New South Wales and South Australia. The result has been that, so far as the former colony is concerned, her stores of sheep and cattle are being drawn upon to a greater extent than they are recruited. To show this we proceed to adduce a number of official statistics. In 1857 there were 2,148,700 horned cattle depasturing in New South Wales, while in 1858 the number was only 2,110,600. Strenuous efforts increased the number in Victoria from 614,537 to 699,330; but the total net increase for the two colonies in the year was only 46,733 head, an advance not equal to the growth of population. But it is in sheep that the most remarkable falling off has taken place. In 1854 there were 8,144,000 sheep in New South Wales; in 1855, 8,602,000; in 1856, 7,736,000; in 1857, 8,139,000; and in 1858, 7,582,000. The great decrease in 1858 is probably accounted for by a large transference to Victoria, where the total swelled up from 4,766,022 to 5,578,413; but the net increase of the year in both colonies was very small, being only 254,991 head. As regards pigs, there was a decrease both in Victoria and New South Wales, the total number in the two colonies being 152,798 in 1857, and only 130,599 in 1858; and, reduced to general results, the per-centage increase and decrease in the latter year for both colonies was as follows:—

	Increase.		Decrease.
Cattle	1.7	....	—
Sheep	1.9	....	—
Pigs	—	....	14.5

In New South Wales there was a decrease in all three classes, viz., of 1.8 per cent. in cattle, 6.8 per cent. in sheep, and 14.9 per cent. in pigs; and that the amount of live stock in the two colonies did not keep pace with the strides made in population is shown by the following illustration of the number of cattle, sheep, and pigs to each 1,000 persons:—

	1857.		1858.		Decrease.
Cattle	355	..	342	..	13
Sheep	1,657	..	1,601	..	56
Pigs...............	20	..	16	..	4
General average....	2,032	..	1,959	..	73

That the conclusions to which these figures point are not considered unimportant by the colonists will be seen in the fact that Sir William Denison, Governor of New South Wales, has not thought it inconsistent with his viceregal dignity to read a paper before the Colonial Horticultural and Agricultural Society "On the supply of animal food for the inhabitants of New South Wales and Victoria." In this paper we find the following important passage:—"I believe that the whole of the pasturage within any reasonable distance of the great markets of Sydney and Melbourne is fully stocked; when I say fully stocked, I mean up to the measure of its present grazing capabilities. How then is the evil to be met? It is evident that if the stock of all kinds is killed faster than it can increase, the deficit will become more pressing day by day; and that even if it be allowed to carry out its ordinary rate of increase, the demand for meat will get more and more urgent, so long as the population adds to its numbers in a ratio in excess of that at which the stock increases. The only mode in which there appears a prospect of overcoming the difficulty, which is becoming every day of greater and greater importance, is by adding to the weight of the stock, by providing better and more abundant food, by changing the breed of sheep, substituting, as in England, an animal with a coarser fleece and a heavier carcase, for the present fine-woolled varieties, making up for the depreciation in the quality of the wool by its quantity, and by increased value of the carcase. In the same way by paying attention to the breed of cattle it might be easy to add 50 per cent. to the weight of the carcase. But the first step must be to improve the paying capabilities of the ground."

These observations possess some interest for the home reader. The Governor-General, it will be seen, tells the colonists that they must in future endeavour to make more of their mutton and less of their wool; and if his advice should be at all acted on, or the numbers of sheep in Victoria and New South Wales should remain stationary, the circumstances cannot be wholly without effect on the British wool market. Those colonies have hitherto been two of the main sources from which we have drawn our wool supplies; and although South Australia, Western Australia, Tasmania, and New Zealand will probably export an increased quantity in future, still it is something if the deliveries from the leading communities do not materially advance. Since 1844 the importations of wool into the United Kingdom have advanced nearly 100 per cent., viz., from 65,713,761lbs. in 1844 to 126,738,723lbs. in 1858; and from Bradford—indefatigable, untiring Bradford!—the "cry is still for more." Of the total supplies, the British settlements in Australia have been the largest contributors; but it will be seen that of late years they have scarcely kept pace with the general increase:

YEAR.	TOTAL SUPPLIES.	FROM AUSTRALIA.	PROPORTION.
	lbs.	lbs.	per cent.
1844	65,713,761	17,602,247	27
1845	76,813,855	24,177,317	31
1846	65,255,462	21,789,346	33
1847	62,592,598	26,056,815	41
1848	70,864,847	30,034,569	42
1849	76,768,647	35,879,171	47
1850	74,326,778	39,018,221	52
1851	83,311,975	41,810,117	50
1852	93,761,458	43,197,301	46
1853	119,396,449	47,076,010	39
1854	106,121,995	47,489,650	45
1855	99,300,446	49,142,306	49
1856	116,211,392	52,052,139	45
1857	129,749,898	49,209,655	39
1858	126,738,723	51,104,560	40

Thus it appears that since the gold discoveries in 1851, the supplies of wool have increased from Australia in nothing like the ratio in which they advanced from 1844 to 1850.

As the stock of sheep is at present barely holding its own, the proportion is not likely to increase, but, on the contrary, will probably still further diminish. The only circumstance which may tend to check the proportional falling off, will be the enforced dispersion of the Victorian population on the eastern, western, and northern shores of the great island-continent, in consequence of the diminishing produce of the gold fields, in which case they would betake themselves, in the first instance, to pastoral pursuits.

Considerations such as we have recited, have no doubt occurred to the shrewd Yorkshiremen, who last year organized a wool supply association, with the view of obtaining their raw material from other districts. But meanwhile the practical result will be that the British wool grower will, at any rate, be enabled to maintain his position in the home market, if, indeed, he does not make more money by the sale of his wool. Our colonial friends call these "Anglo-Australian," questions, and so they are.

A SHEEP-FEEDER FOR MANY YEARS says, "I have taken a great interest in sheep and the management of them in feeding. I have heard of many losses of sheep that have been fed on corn and cake. Many farmers give corn with chaff, and after that, hay, swedes, and other roots; those who have done so have had losses, and cannot account for them. Now, I believe that if they gave the sheep corn and cake the very first thing in the morning, without anything with them, and all the corn at one time in the day, they would not have many losses, and their sheep would improve very fast."

SHEEP-SHEARING.—An old farmer writes: "Farmers who keep sheep should put young men to learn to shear. Shearers are very scarce, and not so good as half-a-century ago."

OUR TRADE WITH DENMARK.

Only a few days' sail to the north from our shores is situate a small kingdom with which we have now and then had some unpleasant dealings in times gone by, from its holding the keys of the Baltic, and charging the shipping of various nations a good round sum for permission to pass the narrow Sound. These differences have, happily, passed away, and we have compromised the matter of Sound dues by the payment of about £1,200,000, as our share of the redemption. Although the kingdom of Denmark has a population no larger than London, yet we carry on a very fair amount of trade with her people, and are likely to do more.

There has been a gradual and regular increase in the general trade of Denmark during the last ten years, and particularly with England. Being almost exclusively an agricultural and seafaring country, Denmark exports comparatively few articles of industry or manufacture, and in this respect therefore offers an excellent market to the British importer. Since the abolition of the Sound dues, its importance to the British wool and cotton trade will be necessarily increased, as Copenhagen will become an entrepôt for Russian produce destined for England on the one hand, and for British wool and cotton goods on the other. The value of our exports to Denmark in the last three years has averaged £750,000, while that of the imports from Denmark is about £2,000,000 to £2,500,000 per annum. The aspect of Denmark generally is that of a rich, well-cultivated country. The constant humidity of the atmosphere is favourable to vegetation. The pasturages are fresh and luxuriant, and the rearing of stock, particularly horses, is carried on extensively. Besides the cereals, tobacco, flax, hemp, and hops are cultivated in some districts, while great quantities of fruit are cultivated in gardens and shipped to Russia.

The distillation of brandy has of late years made rapid strides, while its exportation has correspondingly increased. In the year 1835 45,579,961 quarts of brandy were distilled, of which 3,066,209 quarts were exported. The tax on this spirit forms a very important item in the revenue of the kingdom. Twenty years ago consular returns gave the consumption of grain and pulse in Denmark at a little over 6,000,000 quarters, while that saved for seed was 1,100,000 quarters, and the exports 900,000—in all about 8,000,000 quarters, or a product of about eight bushels to the bushel sown. Since that period, however, a great improvement has taken place in Danish agriculture, and the production is hence greatly extended—the exports, for instance, in grain and pulse being now double what they then were. But it is not merely by the direct trade that we can benefit: the indirect trade is likely to be very considerable. The import and export trade of Denmark in 1855 amounted to about £11,500,000 sterling, and during the last eight years has increased in a ratio of 44 per cent.

The trade of Great Britain, Russia, and Denmark, our Secretary of Legation at Copenhagen believes, will gain largely by the redemption of the Sound dues, and the transit and other dues being comparatively moderate, that Denmark may become an important transit station between England and Russia. Since the years 1854 and 1855, when the trade of Iceland and the Faro Islands was thrown open to foreign nations, another valuable market has presented itself to British trade; the most important export articles from these parts of the Danish dependencies being sheep, wool, tallow, salted fish, horses, and cod-liver oil; the principal imports from England being coal, iron, salt, and manufactured goods.

Looking back as far as 1839 we find the agricultural exports of Denmark were considerable. Thus in that year there were exported to England 240,340 quarters of grain and pulse, and to various countries 11,674 horses, 27,904 oxen, 7,459 cows, 10,737 calves, 14,425 pigs, 16,264 sheep and lambs, 11,273,000 lbs. of salted and cured provisions, 1,070,500 lbs. of cheese, 73,732 barrels of butter, 76,300 tons of tallow, 3,500,000 lbs. of hides and skins, 1,737,100 lbs. of wool, and 10,000,000 lbs. of bones. In 1848, the value of the exports from Denmark to the United Kingdom was £842,321, or more than half of the whole exports. In the next five years the imports and exports increased about half a million in value.

In 1852 the following were the chief articles of agricultural produce imported into the United Kingdom :

	Denmark proper.	Duchies.
Bones (lbs.)	4,575,269	3,723,889
Bacon (lbs.)	1,639,355	2,941,504
Horses (No.)	620	15,390
Cattle (No.)	1,562	60,872
Swine (No.)	1,475	40,564
Hides and skins (No.)	2,216,514	935,518
Wool (lbs.)	2,855,177	664,772
Butter (brls.)	21,351	52,680
Cheese (lbs.)	114,325	1,437,897
Meat (lbs.)	963,340	1,078,375
Corn and grain (brls.)	2,538,166	806,606
Oilcake (lbs.)	6,537,222	18,407,197

Of live stock, we have received from Denmark, on the average of the last five years, 18,000 head of cattle, 1,500 cows, 400 horses, and 10,000 sheep per annum; 3,000 to 4,000 cwt. of butter (although in some years it has been as high as 13,000 cwt.); 7,000 to 8,000 cwt. of salted pork, and a little bacon; 2,500 cwt. of tallow, 13,000 or 14,000 cwt. of hides, 2,800,000lbs. of wool, 10,000 tons of oilcake, a few thousand pounds of bristles, 4,000 tons of bones, 5,000 to 6,000 cwts. of flour, and 850,000 qrs. of grain and pulse.

There is a steady export trade in horses of about 12,000 a year, which are sent chiefly to Prussia, Hanover, and Hamburgh; and about 50,000 head of horned cattle, half of which come to England, and the remainder go to Altona and Hamburgh; 70,000 or 80,000 brls. of butter are also sent to the neighbouring ports.

The countries from which the chief imports take place are England and Hamburgh; those from the latter place, however, can only be considered in great part as in *transitu*. The Danish people are a thrifty and industrious race, and with the advantages now afforded them for the export of their produce by steam vessels and railroads, they are likely to advance even more rapidly in agricultural progress.

EXTENDING THE USEFULNESS OF AGRICULTURAL AND LABOURERS' FRIEND SOCIETIES.

My object in making a few remarks upon this interesting subject is to call attention to the many phases of usefulness which these societies comprise in their operations, with the view of promoting their extension. The department of usefulness to which I confine myself is the encouragement and improvement of the agricultural labourer. This, correctly speaking, would refer mainly to the societies denominated "labourers' friend societies;" but as almost every local society throughout the kingdom combines as essentials the encouragement of good conduct, skill, and industry amongst the labourers in husbandry, with the improvements in the feeding of stock and the management of the farm, I of course include all such admirable institutions; and I should greatly rejoice if my humble efforts should conduce to their extension and improvement.

I have no enviable opinion of those who delight to cast ridicule upon such laudable objects, and scarcely possess patience sufficient to refute their assertions without asperity. Do these objectors imagine the labourer in husbandry to be void of ambition, and that the local distinction of winning a prize is as nothing to him beyond the value of that prize? if so, they are totally mistaken. No one can conceive the intense interest manifested by our provincial ploughmen prior to a contest, but those who have witnessed it. It is a gross and ignorant libel upon our good friends Giles, and Will, and Ben, and Joe. Why, any one of them would traverse a county, even be it as large as Yorkshire, to find a better plough than his own with which to compete. And let me tell such folks that, good as the implement may be, it is the skill of the ploughman alone that directs it aright. There is no mechanical arrangement in the machinery to prevent the workman doing wrong; all depends upon his steady eye, his strong nerve, and powerful arm—*his skill.* It is the same in every department of farm-work; and much of the farmer's success depends upon the proper execution of his work. If farm-work is unskilfully performed, all goes wrong. The ditches and drains fall in from improper construction, the hedges decay from bad cutting, the fields are foul, and the crops defective from bad ploughing. In stock management it is still worse. A negligent herd soon restricts your number of cattle: an ignorant shepherd will soon seriously deteriorate your flock; and these in spite of the master's attention in very many instances.

The main object in all these societies is to promote improvement in every department of agriculture; and for this purpose a very varied and comprehensive prize-sheet is generally prepared, by which competitors are to be guided, and the terms of competition for the various prizes set forth. Those for the encouragement of good conduct, skill, and industry take in the various occupations and positions of the agricultural labourer. The shepherd is rewarded for his attention to his flock, and the prize is chiefly given for the most successful breeding flock; by this he is induced to strict watchfulness whilst the ram is with the ewes, and carefulness in their management throughout the winter, and more especially during the anxious time known as "the lambing season." I never knew a shepherd who did not manifest unusual pleasure in receiving this prize; rejoicing that he had not only obtained honourable distinction amongst his very useful class, but that he had been the means of contributing largely to his master's benefit. Who would not commend the honest man's exultation? The ordinary workmen are rewarded by prizes for skill in farm operations generally—ploughing, stacking, thatching, hedging, ditching, draining, drilling, mowing—indeed, every departmental operation requiring the exercise of skill and carefulness. The honest, sober, and industrious are rewarded by prizes for the laudable manner in which they have brought up their families, the steadiness with which they have laboured on a particular occupation, and similar useful distinctions.

The poor widows are generally included in the list of rewards, depending upon their industrious independence. Much as these simple matters may be ridiculed by some, they have not failed to advance the well-being of the rural population wherever they have been permanently established. I could point to some remarkable instances of improvement in a whole district, from the single fact that for a series of years prizes were offered "for the cleanest and best-managed cottage and garden." It gave a new feature—a new taste to cottage-management and garden culture. The ornamental became commendably mingled with the useful and substantial. The prizes given for the classes of allotment-holders is another remarkable feature in such societies; it not only leads to good cultivation, but stimulates and enforces upon the occupiers the necessity of looking out for the best grain, the best roots and vegetables to cultivate; and the produce reaped by many of these holders is astonishing.

Another feature is creeping very adroitly, and very properly, into these societies; I mean the encouragements to be given to the children of the labouring poor. These are called "educational prizes." This seems probably to some to be stepping a little out of the way, and cannot be included in the common objects of such societies. There are difficulties attending it undoubtedly; but where you can organise a good society, it is very pleasant to find one, and another, and another, from amongst its members, stepping forward with the request, "Only let us give these encouragements through your society: we will find all the money, and relieve your officers from any extra work." In this way much good is done, and with permanent effect.

The prizes for educational purposes usually combine a reward for the schoolmaster who produces the most efficient pupils; for lads who show the greatest proficiency in the common rudiments of learning, and the greatest aptitude upon the trial before the judges; the lasses who, in addition to the above, exhibit the greatest skill in needlework, knitting, darning, &c., and also show the greatest aptitude in the exercises given out by the judges. Constancy of attendance at school is also rewarded. This is comparatively a new feature in such societies. It has long been one of the most interesting phases of the society with which I have been long connected, and works remarkably well; and one of the most remarkable facts about it is this—that while all the National, British, and Free Schools are invited to compete, the *Union House* Schools are prohibited, and, I believe, solely from the known proficiency attained by the children's long and constant attendance upon their teachers there. This speaks wonders. Oh, happy England! thy neglected and lost ones, the pauper and the orphan, are now so cared for and taught, as to become the superiors in knowledge and attainments to their class who are free to labour beyond the walls of these much-dreaded houses. I cannot too strongly commend the adoption of this class of prizes to all societies who have the encouragement and elevation of the labouring classes as their aim and object. It is, in fact, to begin at the beginning: "Train up a child in the way he should go, and when he is old he will not depart from it."

The mode of management of this department is to make it sectional—*i. e.*, to have separate officers and a committee who conduct the whole. The clergymen of the district are the men to take the lead in this department, and invariably show great readiness to do so, and as there is nothing denominational in it, no one can gainsay them. The publication of the prizes in one sheet saves expense. It gives great interest to the society's annual meetings. It creates a laudable emulation amongst the juvenile candidates, and stirs up their teachers to renewed effort.

THE COMMERCE IN CURRANTS.

Few of those who eat their currant dumplings, and plum puddings, or plum buns, perhaps give a thought to the produce, the country, or the extent and value of the crop which yields the bulk of this fruit. Although the trade has hitherto been kept down by exorbitant duties, insomuch that the consumption is scarcely an ounce a week per head of the population, yet the extension of the consumption is of great importance even to ourselves in many points of view. It leads to large shipments of British goods, and a considerable employment of British shipping—many fast screw steamers being now laid on from Liverpool and London to the Mediterranean, and rivalling each other as to which shall bring the first fruit of the new crop to the London market.

The small kind of grape which produces the currants of commerce is grown almost exclusively, and on an extensive scale, in Greece and the Ionian Islands. The crop is a precarious one, from the delicate nature of the plant, and the chances of rain when the fruit is ripening and drying, blight, &c. Six or seven years must elapse after a plantation has been formed before it begins to produce, hence its cultivation requires a considerable outlay of capital. As the reduction of duty is likely to lead to an enlarged consumption, we have been at some pains to wade through the official returns for the last forty years, and the various consular and colonial reports, so as to frame an abstract of the details of the trade in this article, leaving out raisins, figs, and other dried fruits.

Great Britain is the currant market of the world: its consumption exceeding that of all the other nations, and three-fourths or more of the entire produce being imported into this country. Formerly the Ionian Islands furnished the largest supply, but now the Morea sends the principal quantity. In the ten years ending with 1840, the average annual imports were 130,330 cwts. from the Ionian Islands to 52,939 from Greece; in the next ten years the average supplies from each country were nearly equal, 165,328 cwts. annually from the Ionian Isles, and 168,639 cwts. from Greece. In the eight years ending with 1858, however, Greece took the lead very largely, the annual exports being on the average 81,367 cwts. from the Ionian Islands, and 227,839 cwts. from Greece. The far greater proportion of the value of the currants we import is paid for by our exports of British manufactures. During the five years ending 1855 our exports to the Ionian Islands exceeded our imports there by £177,129, and in the last four years they about balanced. And even to Greece about one-half of the imports are paid for with British manufactures. The carrying trade between the United Kingdom and the producing countries is principally conducted in British bottoms, to the extent in ships of 72 per cent., and in tonnage of 62 per cent. of the whole commercial marine employed. The annual consumption of currants in the ten years ending 1830 was 108,063 cwts.; in the ten years ending 1840, 164,200 cwts.; in the ten years ending 1850, 314,300 cwts.; and in the nine years ending 1859, 294,395 cwts.

The article has been looked to as a source of revenue by the government, yielding on the average perhaps a quarter of a million a year; although being consumped chiefly by the poorer and middle classes, the duties levied here and in the producing countries have added materially to the price of the fruit, and checked extended consumption. In 1834, when the duty was reduced from £2 4s. 4d. to £1 2s. 2d. per cwt., the consumption increased from 7,000 tons, which it had been in the previous year, to 9,678 tons in the following year; and when in 1844, the duty was further reduced to 15s. 9d. the cwt., the consumption increased from 12,716 tons to 15,474 tons, while last year it reached 24,121 tons. It will be seen from the following rates of duty that France charges the lowest duty upon currants—

Austria	£11	0	0	per ton.
United Kingdom	7	0	0	"
Russia..............	4	0	0	"
United States........	3	5	0	"
Holland	1	16	8	"
France..............	0	5	0	"

Having dealt with the fiscal part of the question, let us now look at the cultivators' side. We have already alluded to the immense strides made in production in Greece. In the Ionian Islands currants have always been the staple crop. From 1828 to 1836 the land planted with currants there was on the average 13,000 acres, and the crop from 15,000,000 lbs. to 25,000,000 lbs. In the three years ending with 1839 the land under crop was 17,000 acres and the yield 15,000,000 lbs. to 16,000,000 lbs. per annum. Of late years, with a larger extent of land the crop has been more precarious. It will be seen from the following return that a very great extent of land has within a year or two been put under vine culture in the Ionian Islands.

	Acres.	Crops. Millions of pounds.
1850..	20,276	31,345
1851..	20,748	28,556
1852..	28,940	17,185
1853..	7,977	6,828
1854..	8,031	5,437
1855..	183,720	7,715
1856..	115,220	18,480
1857..	522,759	21,355

Cephalonia and Zante are the islands where the cultivation is principally carried on. Ithaca raises a small quantity; but in Santa Marura and Cerigo the culture has been almost given up.

Mr. Neal, the British Consul at the Piræus, in his report of the trade for the year 1857, stated that the currant crop, which it was expected would have yielded 80,000,000 Venetian pounds, only produced 61,000,000, owing to a heavy fall of rain at the end of the season. Still this quantity was a large increase on other years, and from before the Greek revolution, when the production was only 10,000 Venetian pounds. The quantity of land under culture with the currant crop in Greece in 1858 was about 250,000 acres. Owing to the sudden fall in the price of currants, the Greek Government reduced the taxes on currants for 1858 from 36 to 18 drachmas, or from 23s. to 11s. 6d. per 1,000lbs., equal to 1s. 3d. per hogshead. The receipt of nearly £1,000,000 sterling for currants, besides enriching the proprietors of the land and the merchant, must have directly benefited the 200,000 inhabitants who occupy the currant district.

In 1857 a heavy disaster happened to the currant crop in Greece, by continued heavy rains, which fell during the period when the fruit was out on the drying-grounds. Only about 4,500 tons of sound fruit was got in, whilst the remainder, about 19,000 tons, was so severely damaged, that a great part was found to be unfit for exportation, and a considerable portion was used for distillation. A joint-stock company, with a limited capital, was formed, under the auspices of the Government, for the purpose of distilling wines and spirits from the inferior descriptions of currant, and skilled hands were introduced from France and Sicily.

In consequence of the effectual remedy discovered, in the application of sulphur for preventing the blight from attacking the currant vines, a crop of 18,835 tons of fruit was produced and shipped from Greece in 1856, against 4,350 tons in 1855. As the price averaged about £45 per ton, the value of the crop in that year was estimated to be £817,575. The currants grown at Pyrgos, are generally sent to Patras in small coasting vessels, and are consequently included in the return of the trade at that port. The produce at Calamata amounted in 1856 to about 2,117,500 lbs., valued at £24,200 sterling, which was principally shipped to Trieste. The average local prices of currants per cwt. in 1856, were at Patras, £2 6s.; at Pyrgos, £2; and at Calamata, £2 2s.

There was a very large crop of currants produced in Greece in 1858; and although the price ranged from 15s. to 25s. per cwt., against 25s. to 55s. per cwt. in 1857, still the additional quantity of currants grown more than made up for the decline in prices. The following was the quantity of currants exported from the Morea in 1858: To England, 24,330 tons, of which 3,500 tons were of the growth of 1857; to Trieste, 1,793 tons; to Germany, 339 tons; Holland and America, each 142 tons; France, 40 tons. In all, 27,369 tons; and about 2,000 tons remained unsold, from the decline in prices and demand, owing to a stock of about 16,000 tons having accumulated in England. This was a larger crop than that of 1851, generally referred to as an excellent yield, when 26,128 tons were produced.

As the cultivation of the Corinth grape is being attempted in the United States, in Western Australia, and other quarters, it may be well to mention that the blight has been stayed, and the quality improved by the use of sulphur, and training the branches of currant vines on the ground. It is considered necessary to apply sulphur at three distinct periods, viz., 1st. when the shoot of the currant vine is sprouting; 2nd. when the fruit is just set; and lastly, when the fruit is turning red.

THE TRADE IN CURRANTS.

IMPORTS INTO THE UNITED KINGDOM,

Year.	*From Ionian Islands.*	*From Greece.*	*Total*
	Cwts.	Cwts.	Cwts.
1821.	Not particularized.	Not particularized.	98,156
1822.			104,017
1823.			99,689
1824.			128,300
1825.			126,298
1826.			85,235
1827.	120 544	730	144,589
1828.	131,675	5,153	163,835
1829.	102,139	8,785	119,928
1830.	90,356	6,618	113,891
1831.	162,363	21,132	212,900
1832.	108,079	45,148	165,658
1833.	97,912	28,569	142,539
1834.	153,404	31,094	192,785
1835.	127,571	45,286	176,063
1836.	136,773	56,216	196,561
1837.	156,043	52,468	217,921
1838.	94,440	74,162	169,733
1839.	133,374	71,524	206,969
1840.	133,343	83,795	221,119
1841.	107,604	65,021	173,680
1842.	156,840	106,175	267,086
1843.	142,485	92,173	240,274
1844.	133,953	141,194	284,378
1845.	175,872	168,045	352,706
1846.	266,308	125,034	395,094
1847.	185,659	205,555	395,574
1848.	174,656	225,175	402,267
1849.	171,709	282,819	457,592
1850.	138,202	275,201	429,607
1851.	54,596	105,115	721,119
1852.	233,501	447,742	347,088
1853.	59,321	130,986	267,265
1854.	43,260	61,849	120,253
1855.	37,605	88,801	163,729
1856.	50,332	269,657	351,725
1857.	82,863	263,426	398,849
1858.	89,458	455,136	582,380
1859.	Not particularized.		557,861

Quantities of Currants taken for consumption since 1820, and forward:

Year.	*Consumption.*	*Net Revenue.*	*Year.*	*Consumption.*	*Net Revenue.*
	Cwts.	£		Cwts.	£
1821.	95,142	210,946	1841.	189,907	221,125
1822.	96,553	214,115	1842.	196,379	228.662
1823,	95,050	210,859	1843.	254,330	296,364
1824.	107,630	238,562	1844.	284,694	251,659
1825.	105,526	234,036	1845.	309,485	243,706
1826.	110,425	244,901	1846.	358,761	282 617
1827.	119,670	265,366	1847.	331,236	260,925
1828.	118,400	262,568	1848.	380,080	299,097
1829.	114,077	253,350	1849.	433,044	340,897
1830.	118,158	261,670	1850.	405,077	319,030
1831.	149,018	330,341	1851.	454,276	357,852
1832.	142 717	316,697	1852.	362,337	285,303
1833.	140,445	311,063	1853.	186,293	146,707
1834.	163,523	242,180	1854.	171,231	134,851
1835.	193 569	214,537	1855.	156,348	123,125
1836.	175,774	194,821	1856.	226,123	178,074
1837.	174,842	193,893	1857.	255,996	201,599
1838.	166,424	184,492	1858.	384,531	302,819
1839.	170,931	189,292	1859.	482,425	398,007
1840.	164,747	188,678			

The rates of duty were £2 4s, 4d, per cwt. down to 6th August, 1834; £1 2s. 2d. from that date to 6th June, 1844; and 15s, 9d, per cwt, subsequently.

THE "ESTABLISHED BREEDS" OF SHEEP.

Great bodies, like great minds, sometimes clash. In the first week of the new year the Committee of the London Farmers' Club were sending down a request to Mr. Charles Howard that he would give them an opening for a discussion on the merits of pure and cross-bred sheep. At just about the same time Mr. Spooner, of Eling, must have been revising the proof-sheets of his paper on cross-breeding for the new number of the Royal Agricultural Society's *Journal.* There was no previous consultation or arrangement whatever over such a coincidence. The two Associations stand a little too much in their own "rights" for this; not that either will in any ways suffer from the mutual support and corroboration thus accidentally arrived at. On the contrary, Mr. Spooner's able essay came as a most appropriate prologue to the meeting at the Farmers' Club; while Mr. Howard's equally excellent and practical address is the best possible commentary on the paper of his precursor. One, as we see now, would have been scarcely complete without the other; and if ever these two august assemblies were to seek a fitting opportunity to shake hands and make friends, they could never find a better one than over these congenial productions.

It is noticeable to see how the champions of their several societies travelled on to the same conclusions. Mr. Howard, of course, was named by the Club as a well-known breeder and exhibitor of a certain description of sheep; and the very wording of his question made his course a tolerably obvious one. Mr. Spooner, on the other hand, is looked upon at the great meetings of the Royal Agricultural Society rather more as an authority for horses than sheep; while his theme, "on cross-breeding" simply, left the treatment of it open enough. It might have turned on the different crosses for horses, by no means an uninviting section of the subject; or of cattle, Shorthorns and Herefords, Highlanders and Shorthorns, and so on; or even of pigs, Chinese and English, Neapolitan and English, or large and small. Mr. Spooner, however, dismisses all these, even his favourite, the horse, very summarily; and goes on to say, that in its first importance, cross-breeding with him means very much what it does with Mr. Howard, the cross-breeding of sheep. This, in fact, is one of the great features of modern husbandry. Flocks of pure-bred sheep, one man will tell you, have their chief value for crossing; and another at his elbow shall vehemently assure you there is now no such thing as a pure-bred-sheep in the country. Mr. Robert Smith, with characteristic caution, speaks of the leading varieties as "established breeds." And then straightway every ram breeder declares his own to be an established breed. The Shropshires long maintained they were, and at length their claim is recognized. But, of course, no sooner is this allowed than the Hampshires, the Oxford Downs, and other long-wools and short-wools, all demand equally distinctive rank. It has been said that it takes twenty years to "make" any certain sort of sheep. That is, within such a period the produce must be entirely from the same description of animals, whatever they may have been crossed up to previous, and the proper foundation having been once determined upon. Here is manifestly the great difficulty. Be it an ox, a sheep, or a pig, there is nothing more profitable than a first cross, if you only intend to sell it and stop there. Or, as is the common practice, to be continually repeating the process. But ambitious spirits get beyond this, and as Bakewell improved the Leicester, and Jonas Webb the Southdown, so would others permanently amend the native breeds of their own districts.

There is all proper precedent for so laudable a desire. Mr. Howard even tells us that, "Bakewell died, and his secret was buried with him; but there is very little doubt the Leicesters are the result of a cross of the various long-woolled breeds in his own immediate locality, and which he succeeded in turning to good account." Mr. Spooner, again, says, "The Southdown is, perhaps, one of the purest breeds we have. No one asserts that the immense improvement of this breed by Ellman was due to any crossing; whether the increased size and further improvement which it has received in other counties have been effected in all cases without a cross of any kind, may be in the minds of some a matter of doubt." It is very certain that some thirty years since there was a breed of large useful but coarse short-woolled sheep in Sussex, that the Ellmans would never admit to be Southdowns, but that strangers were wont to fancy nevertheless. A Mr. Ridge was especially famous for them, and his black-faces still break out occasionally amongst the improved Southdowns. In fact, the whole tenor of what was said at the Farmers' Club, as well as in what has been written in the *Journal* of the Agricultural Society, go to show that our great successes in sheep-breeding are traceable to judicious crosses, "the secret" in the first instance having generally been tolerably well kept. Our most recent of all authorities, Mr. Tulliver, in the new novel of *The Mill on the Floss,* says that "the worst on't with the crossing of breeds is that you never can justly calkilate what'll come on't." But with such established sorts as the Hampshires, Oxfords, and Shropshires, the good miller will soon stand alone.

Still it is only right and fair to offer any evidence to the contrary, and well as Messrs. Howard and Spooner pull together, the discussion may yet warm up. The agricultural authority, indeed, of the *Economist* has already drawn out no less a man than Mr. Valentine Barford. His letter appears in reply to some strictures on his system, as passed in a notice of Mr. Spooner's paper. It tells so well here that we might almost take it as from a speech in the Monday evening's debate at the Club. Mr. Barford says:—"Half a century of experience has convinced me, where two nearly-related animals are true in form, sound in constitution, and I am sure that they have no hereditary tendency to disease, in-and-in breeding does not induce degeneracy, and therefore I have no hesitation in coupling them. In fact, I think relationship is a consideration of much less importance than form and constitution. Nor do I 'neglect the advantages offered to me' by my fellow-breeders MERELY 'for the sake of preserving purity of descent' (this being, as I have just said, when not combined with purity of FORM, of no value at all, but rather the reverse), but because I doubt whether they are *advantages.* At one period of my life, from about the years 1812 to 1825, I was anxious to improve my flock, if possible, by the introduction of fresh blood; and for this purpose I inspected, I believe, every flock of new Leicesters then in any repute, but (I say it without any wish to depreciate others) *I could not find one* whose form and quality I thought equal or at least superior to my own, and so I became an in-and-in breeder, if you call it so, not so much from choice as necessity, and the same reason for remaining so has existed ever since; for it is absurd to suppose that I should, knowingly, use an animal inferior to my own. I grant that in this view of the case, my ultimate success or failure hinged upon whether I had or had not formed a correct opinion as to what was the true form of a sheep. That I *was* correct is, I think, amply demonstrated by the undisputed fact that my sheep have not degenerated in any one desirable quality; for it is evident that any flock or herd bred for the number of years I can point to without addition of fresh blood, must have almost died out from sheer diminution of numbers, under the 'careful selection and rigorous weeding necessary in all flocks, and, in the few remaining, purity of descent would only increase the evil, from their great liability to transmit defect to their offspring; and, on the other hand, purity of descent, when combined with true form, becomes of immense, I had almost said of inestimable value, and which increases with every year the breed is maintained." Mr. Barford has the pedigree of his sheep from the days of Bakewell; but then even Bakewell's Leicester, "there is very little doubt, was the result of the cross." However, the owner of the Foscote flock is still staunch in upholding such purity as he found it: "I go a step further, and without ignoring 'the labours of improvers' subsequent to Bakewell,' let me ask if most of them have not sought to *improve* the breed by introducing alien blood. Judging from the diversity of type and character that nearly every flock of Leicesters exhibits when compared with others, and with those of ten or twenty years since, as well as from common report, I firmly believe this. In fact, I cannot account for this diversity in any other way; and taking into consideration the frequent exchange of rams between all the principal breeders, it is almost impossible that one can exist without some stain in blood, however remote. How, then, can I, who have kept mine pure, use a ram of any other breeder's without cross-breeding?" There is a deal of truth in this; all still tending to the same end—that we have nothing but crosses. In one respect Mr. Barford supplies a very palpable deficiency in the Farmers' Club Discussion. The speakers, almost as a rule, were shy of saying much of their own practice. Mr. Howard, with commendable modesty, was careful not to cry up his own commodities; although it would have been interesting to have heard more definitely how certain sorts did in certain districts, how they were arrived at, and how maintained. Is there a little "secret" here, again? Mr. Barford, at any rate, makes none of his practice; and we must in justice allow him the benefit of the deduction. "I shall, perhaps, be considered too partial a witness if I assert that my sheep are not small. An animal of true symmetrical proportion always appears smaller than he really is, and I invite everyone, before giving a decided opinion, to measure the girth, length, &c., of mine, and compare them with others. And I am certain I could by now have shown them many sizes larger, had I indulged and forced them as many breeders have, but I am sure I should have lost more in hardihood and constitution than I should have gained in size."

The recognition of the Shropshires by the Royal Agricultural Society, the paper in the Journal, and the discussion at the Club, will all tend to give further colour to the cross-breeds. We are, in a word, more and more suiting ourselves to circumstances. But a little caution may be necessary. Let us not be in too great a hurry to "establish" new breeds; and when we have given them a rank and a name, let us firmly abide by it. The Shropshires are already known in some parts of England and all over Ireland as "Shrops," an abbreviation in no ways necessary, and that may eventually lead to some confusion. As to Mr. Howard's own sort, "the Oxford Downs," this is clearly a misnomer. There is not enough of the Down character about them; and with a title ready made for their use they should have been known as "the Oxford Mixture."

LONDON, OR CENTRAL FARMERS' CLUB.

THE BREEDING OF SHEEP.

The ordinary monthly meeting for discussion took place on Monday evening, April 2, the subject being "The Merits of Pure-bred and Cross-bred Sheep," to be introduced by Mr. C. Howard, of Biddenham, Bedfordshire. The chair was taken by Mr. L. A. Coussmaker, of Westwood, Guildford; and among other members present were Mr. John Thomas (Bletsoe), Mr. J. Marshall (Lincoln), Mr. B. P. Shearer, Mr. H. Trethewy, Sir H. Muggeridge, Mr. W. Fisher Hobbs, Mr. G. Dobito, Mr. Charles Howard, Mr. S. Skelton, Mr. James Thomas, Mr. J. B. Spearing, Mr. W. Gray, Mr. James Howard, Mr. N. G. Barthropp, Mr. R. Bond, Mr. H. Cheffins, Mr. J. Parkinson, jun., Mr. J. Coleman, Mr. J. Bradshaw, Mr. H. Shotter, Mr. W. Cother, Mr. J. Cressingham, Mr. R. Edmonds, Mr. R. G. Welford, Mr. Marsh, Mr. Harrison, Mr. Heard, Mr. J. G. King, Captain Lay, Mr. N. Rix, Mr. R. Palgrave, Mr. J. Goodwin, Mr. J. Wood (Croydon), Mr. J. Whaley, Mr. J. Sanderson, &c., &c.

After a few introductory remarks from the CHAIRMAN,

Mr. CHARLES HOWARD said: The subject for discussion this evening was not proposed by myself, nor is it one I should have chosen, but receiving an unanimous request from the committee, with some diffidence I consented to introduce it. As this is my first appearance here in so prominent a position, I must ask your kind indulgence, for I cannot but remember that I am following closely upon the heels of our talented friend, who gave us this day month a most able and interesting paper upon a very important subject. It is not my intention to extol one particular breed at the expense of another, for doubtless each has its advantages according to soil and climate, but I shall endeavour to confine myself as much as possible to the subject of my paper, viz., "The Merits of Pure-bred and Cross-bred Sheep." From a very early period in the history of the world the sheep has been necessary to the existence of man, and has consequently received corresponding attention at his hands. We read Abel was a keeper of sheep, and that it formed a very considerable portion of the wealth of the pătriarchs; that it was well cared for is conclusive from the history of Jacob, who seemed to be tolerably well-up in his experience as a shepherd. The sheep now, as then, I may truly say engages the chief attention of the farmer, and no doubt will continue so to do, for notwithstanding the glowing picture of farming *sometimes* drawn by Mr. Alderman Mechi

(I feel it difficult to reconcile the worthy Alderman's views upon the large profits of farming hereafter to be obtained by agriculturists, with the strenuous exertions he is making for the permanent establishment of an asylum for broken-down farmers), with our present knowledge and appliances, wheat cannot be grown at a profit, at the prices we have lately realized; and as in all probability we shall continue, so far as bread stuffs are concerned, to feed the people at cost price, we must look well to our flocks and herds, and encourage those breeds that we find the most profitable, for it is from this branch of our business we must expect remuneration. Hence a discussion upon the different breeds of this valuable animal may not be unworthy the time and attention of the members of the Central Farmers' Club. The cultivation of the sheep is of great national importance, for it supplies us with the most nutritious food, which I may fairly state is now the chief diet of Englishmen. Our roast beef has always been our national boast, but not less so now is our mutton, for in no country is it equalled, and the demand for it is enormously on the increase; but important as is the carcase, not less so is the fleece, for it forms the staple commodity of a most important branch of our national industry, and thereby affords employment and sustenance to many thousands of our fellow-countrymen. The importance of sheep to agriculture is well-known; the sandy plains of Norfolk, the hills of Hampshire and Wiltshire, and the wolds of Gloucestershire, Lincolnshire, and Yorkshire have all been made fertile by its means; and although folding since the introduction of portable manures has not been carried on to so large an extent, yet there are whole tracts of country inaccessible to a dung-cart, that are still made productive by this invaluable animal. The sheep of this country are divided into two classes, short-woolled and long-woolled; the established breeds under the former are South or Sussex Downs, Hampshire or West Country Down; under the latter are Leicester, Cotswold, and Lincoln; all possessed of some most excellent qualities, or they would not have made their way, and all but exterminated the various local breeds that were once to be found in this country; and perhaps it will be well briefly to glance at the history of these breeds.

The South or Sussex Downs are most probably descended from small grey and dark-faced sheep, which were found upon the hilly and mountainous districts throughout England. The late Mr. John Ellman found a very inferior and ill-formed description of sheep upon the downs of Sussex; but being possessed, like Bakewell, of an infinite knowledge of the physiology of breeding, by a judicious selection of his animals (but what selection it was the world is not acquainted), he produced an animal with as many good points as its prototype had had; but their greatest improvement devolved upon a gentleman, a worthy member of this club—I allude to Mr. Jonas Webb—who, regardless of expense, has moulded the sheep to his own views, and made it, as regards its shape, almost perfect. The peculiar merit of this breed consists in its superior quality of mutton and wool, and I gather from a letter of Mr. Jonas Webb's, in reply to a statement of Mr. Druce's, in Vol. XIV. of the Royal Agricultural Society's Journal, their average weight at from 13 to 15 months old is about 9 stone, and the weight of wool of the entire flock about 6 lbs. Doubtless this is beyond an average of the breed, but as Mr. Webb is a ram breeder and a high keeper, this can easily be accounted for. That this is beyond an average I am supported by my friend Mr. G. W. Baker, who for some years had the management of the Park Farm at Woburn, where a large flock of Southdowns is kept. He states "that no more than 5lbs. each was their average weight of wool, and as they do not develope themselves so quickly as the Leicesters or crosses, he found it the most profitable to keep them until they were 18 or 20 months old before disposing of them, when from their superior quality and nice weights, they command very high price per lb. in all markets." The ewes are capital breeders, generally producing one-third twins, and are excellent mothers. This breed is doubtless best adapted for elevated situations and bare pasturage, where activity is necessary for getting the stomach filled, and where folding is pursued, their activity being in their favour, they are a highly desirable class of sheep; from their gay and beautiful appearance they find strong supporters amongst our nobility and amateur farmers, and are considered by them the *élite* of our breed.* The Hampshire and West Country Down is a very important branch of the Down family; and as the Sussex Down is the favourite in the eastern counties, so is this breed in the western and south-western counties. Again, as the Sussex Downs are descendants of the sheep which formerly occupied those hills, the latter are descendants of those white-faced horned sheep that had ranged from a very early period the hills and downs of Wiltshire and Hampshire. Their improvement dates from the commencement of the present century, when recourse was had to the Southdown; from successive crosses this very valuable class of sheep was established, and I think it will be generally admitted that a flock of Hampshire Downs now presents as great a uniformity in wool, colour, and general appearance, as their smaller but handsomer cousins the Southdowns. They have lately rapidly risen in public estimation, and find considerable favour in the London markets. But it is said by some (with what truth I know not) that like the Londoners, who are fond of them, they have rather large appetites. A gentleman who stands high as a successful exhibitor of this class of sheep at our national shows, in reply to my inquiries, states that "they are the best description of sheep for Wiltshire, Berkshire, and Hampshire; in fact, the large sheep fairs, such as Overton, Alresford, Wilton, Ilsley, and Weyhill, are supplied with very little stock of any other sort; they are very hardy and of good constitutions, good wool bearers (the average weight of a well-kept flock is from 6 to 7 lbs. each fleece), of early maturity, and have plenty of lean as well as fat meat; they will graze to almost any weight you may think proper to make them." The same gentleman also states "that they have been very much improved the last few years by a slight cross with the Southdown." Another gentleman, not a breeder of Hampshires, but who has had considerable experience in the feeding of them, states that "they are a good useful sheep: the better bred ones will bear comparison with other breeds; but there are some not to be desired—those that are too large are very slow in feeding, and when fat are of second quality;" and in his opinion "it is very easy to get a Hampshire too big." The ewes are good breeders and sucklers, and, combined with the excellent management they receive in these counties, some most extraordinary lambs are raised, which at barely eight months old command enormous prices at their autumn fairs. Their draft ewes also find a ready sale, and are distributed throughout many parts of England, chiefly with the view to cross with the Cotswold or other long-woolled rams; but the former is more commonly used, and I have seen some very wonderful lambs the result of this cross. So much for the short-woolled sheep. There is no reliable information as to the course pursued in establishing the

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* Before dismissing this popular class of sheep, perhaps I ought not to omit a strong point often urged in their favour, viz., that a larger number can be kept upon the same average than of the larger breeds.

Leicester sheep; for, when Bakewell died, his secret was buried with him; but there is very little doubt they are the result of a cross of the various long-woolled breeds Bakewell had at his command in his own immediate locality, and which he succeeded in turning to a good account by the production of this valuable breed of sheep; for it cannot be denied that to this animal all other long-woolled sheep, and perhaps some others, are indebted for their improved shape and greater disposition to fatten. These sheep have been so long before the public, and their qualities are so well known, that I shall not occupy your time with any lengthened remarks upon them; their chief characteristics are aptitude to fatten, with a comparatively small consumption of food, and early maturity; they cut a good fleece of wool, upon an average of 7 lbs. each, and weigh at 14 or 15 months old from 9 to 10 stones each. Some friends of mine in our own county, who have been very successful exhibitors at the Smithfield Club Show in this class, regret that they cannot be considered good breeders or sucklers—it is a rare thing to have more lambs than there are ewes put to the ram; they also inform me that they find some difficulty in satisfactorily disposing of them when fat, as the public taste shows a decided preference for a black leg and a dark face. The Cotswold or Gloucester sheep is one of the oldest of our breeds. Mention is made of them in the early history of this country, and Miss Strickland says, in her "Lives of the Queens of England," vol. i., page 449, "that there is little more than tradition to support the assertion that to Eleanora of Castile, Queen of Henry II., England owes the introduction of the breed of sheep for which Cotswold has been so famous. A few of these animals were introduced by the care of the Queen from Spain, and they had increased to that degree in about half a century, that their wool became the staple riches of England." If this be true, they doubtless became very much improved upon their introduction to this country, for it is recorded that some 300 years after, Edward IV. gave permission for some to be sent back to Spain. They were originally very coarse animals, with a thick heavy fleece, and well adapted for the bleak, unenclosed Cotswold hills; but since the enclosure of the land and its better cultivation, a great improvement in this class of sheep has taken place: there is little doubt this was effected by the use of the Leicester, which without diminishing their size improved their quality, and gave them a greater aptitude to fatten. Among the men to whom this country is indebted for improving this breed were Messrs. Charles Large, William Garne, W. Hewer, and C. Barton. To Mr. Robert Garne, the well-known breeder, I am indebted for much of my information. Among other observations, he states, "they are capable of enduring great hardships, succeed well in exposed situations, and on nearly every kind of soil adapted for sheep farming, producing a great amount of mutton and wool at an early age, and it is no unusual thing to see in the best flocks sheep of 16 stone when only 12 months old." In confirmation of this, I saw, when at the Oxford Cattle Market, the second week in March last, a pen of shorn tegs, of Mr. Gillett's, of Astrop, weighing quite 16 stones. Mr. Garne also states that "the weight they may be made, as old sheep, is enormous." He had one at the last Christmas Cattle Market weighing 43 stones, or 86lbs. per quarter, for which he obtained £8 10s. The average weight of an ordinary flock when fit for the butcher, at 14 or 15 months old, is from 12 to 13 stones, and the weight of wool of the whole flock would approach to 8lbs. each. The Cotswolds cut a grand figure, and generally form a very attractive portion of the Royal Agricultural Shows. There are between 3,000 and 4,000 rams annually disposed of; and a good export trade is now carried on with Australia as well as to the Continent. The great demand for them is for crossing; and perhaps it may be considered one of our best sheep for this purpose. I think it most likely our friends on the Cotswolds will retain their monopoly, for perhaps in no other part of England can they be so successfully bred. As the western part of this island is famous for the handsome upstanding Cotswold, so is the eastern, or more properly north-eastern, esteemed for the heavy-woolled and large-framed Lincoln, to which district they especially belong, and where they have for many years held their own. They, too, like the Cotswold, have been improved by an admixture of Leicester blood. Mr. J. Algernon Clarke, who is well known to many of you, and who reads a paper here next month, thus speaks of them: "The present improved Lincoln sheep partakes largely of the peculiarities of both Cotswold and Leicester, having the expansion of frame and nobility of appearance of the one, with the quality of flesh, compactness of form, beauty of countenance, and propensity to fatten of the other; but they far exceed either in the weight of their fleece. Under good management their wool is of a quality which rarely fails of obtaining a price equal to that of the lighter long wools, and there is therefore no breed perhaps that can equal this in rapidity of growth and propensity to fatten under a skin so weighty and so valuable." There are instances of a most remarkable weight to which these sheep have attained. In 1826, Mr. Dawson, of Withcall, killed a three-shear sheep, weighing 96½lbs. per quarter; a two-shear, weighing 91lbs. per quarter; and a shearling, 71lbs. per qr. Mr. Robert Smith, in his report of Lincoln sheep at the Warwick show, states that "he has known 14th months old lamb-hoggs slaughtered at Lincoln April fair, thirty together averaging 35lbs. per quarter, and one hundred together clipping 14lbs. of washed wool each." It is not the common practice for breeders of Lincolns to have them fit for the butcher at 14 or 15 months old, but they are generally kept until they are 22 to 28 months old, when their weight will be from 30 to 40lbs. per quarter, and cut a second fleece, weighing from 10 to 14lbs. The weight of wool of an entire flock, under fair average management, is about 8½lbs. each; in some cases, especially on good layer, this weight no doubt is exceeded. Mr. John Clarke's Lincoln prize ram clipped 51¾lbs. of wool in three years, an average of 17¼ lbs. each year; while a neighbour of his, in 1859, clipped 327 hogget fleeces, which weighed altogether 130 tods, an average of over 11 lbs. per fleece. The Lincoln breeders consider the mutton of admirable quality, having less fat, and a greater portion of fine-grained lean flesh, than the Leicester. The ewes are good breeders, but like the Cotswolds and Leicesters are not good sucklers. Mr. Clarke concludes his letter by stating that "it is certain that neither Cotswold nor Leicester sheep, in cases where they have been tried (I suppose in that district), have equalled the Lincolns in the value of wool and mutton together produced per acre, and no other breed can furnish such big and heavy-skinned lamb-hoggs as those which are the graziers' attraction at Lincoln, Caistor, and Boston spring fairs." So much for the long-woolled breeds. Having touched upon the history and merits of the leading breeds of sheep, I now approach that part of my paper upon which, doubtless the discussion will turn. The crossing of the various breeds of sheep has of late years become very common. A great demand has sprung up for them, and as they produce a better quality of mutton than the long-wools, and a greater weight of both mutton and wool than the short-wools, they have found considerable favour amongst those who look more to return than to breed or fashion. In fact, I think I shall be borne out when I say so, that pure stocks are the exception, and that animals of the various established breeds are principally used for crossing. The progress crosses have made in this country is proved by their competition at the Smithfield Club. Through the kindness of Mr. Brandreth Gibbs I am enabled to give the return of the entries. Prizes were first established for cross-breds in 1843, now seventeen years ago. During the first nine years the average number of pens was only 8½, but during the last eight years they have averaged within a fraction of 17; while the Leicesters during the first nine years averaged 19 pens, they have during the last eight only reached to 17. I do not intend to go into the question of food, for it must be admitted that the long-woolled breeds will doubtless put on the greatest amount of fat in proportion to the food consumed than any other. But this is not all the farmer requires: when he has produced his mutton he wants a market for it: crosses find a more ready sale, and a much better price, which more than makes up for the increased consumption of food. There is a very great difference of opinion upon the subject of crossing, many, very many still contending that it is not desirable to go beyond the first cross; and the most successful and common mode pursued is to use a long-woolled ram upon South or Hampshire Down or other dark-faced ewes. This course has been found to answer better than a short-woolled ram upon long-woolled ewes; for the produce generally partakes of the size of the male, and this, having an eye to the butcher, is a great desideratum in crossing. The great objection urged by many against this system is that, as all the produce is sold off annually, the breeder is driven into the market every year for ewes, which are mostly the draughts of other people's flocks, thereby running the risk of introducing all manner of diseases on to his farm; besides, there is a want of uniformity in the lambs, some taking after the sire and others after the dam; moreover, having to purchase ewes every year, the demand is increased and the supply is diminished. This cannot be desirable; for with a fast increasing and flourishing population, bringing with it a growing demand for meat, the breeding of sheep cannot be too extensively carried on. Although I may be travelling somewhat out of the record, I would observe, in passing, that I am aware an objection is raised by some farmers to the keeping of a breeding flock, but taking a run of years on most farms I must think it to be greatly in favour of such a system. A custom has become prevalent, in many quarters, of keeping only what is called a dry flock, with an idea that such a course is more profitable: it certainly may be attended with less trouble, but I very much doubt its policy. I can look round me and find that most of those men who have made farming a successful occupation have generally been extensive breeders and rearers of stock. The objections I have stated to the mode of crossing I have described have been felt by many, and successful efforts have been made by the men of Shropshire, Oxfordshire, and other districts to produce sheep that unite the well-known and acknowledged good qualities of the Down with the larger-framed and heavier-fleeced long-wools. What has been done can be done again. If it was possible for Mr. Bakewell, by a judicious selection from the various long-wools, to produce the new Leicester, and for the Hampshire men, by the use of the Sussex Down, to change the characteristics of their native-horned breed, who shall say it is not possible at the present day, with our enlarged knowledge and increased facilities, to produce results equal to those who have gone before us? The Oxfordshire and Shropshire men, in their attempt to establish these newer breeds, are backed up in their principles of breeding by a very high authority—a gentleman who is a member of this Club. I allude to Mr. Spooner, who has written a most excellent paper upon the cross-breeding of sheep, in the Journal of the Royal Agricultural Society of England; and I will take this opportunity of saying that, for practical papers and good downright farmers' reading, no previous journal has equalled it. Mr. Morton, I know, did his best to make it so. I trust, now that it has fallen into other hands, it may be conducted in like manner. Mr. Spooner says, in one of his conclusions bearing upon this point, 'Although the benefits are most evident in the first cross, after which, from pairing the cross-bred animals, the defects of one breed or the other, or the incongruities of both, are perpetually breaking out, yet, unless the characteristics and conformation of the two breeds are altogether averse to each other, Nature opposes no barrier to their successful admixture; so that, in the course of time, by the aid of selection and careful breeding, it is practicable to establish a new breed altogether. This, in fact, has been the history of our principal breeds.' Mr. Spooner goes on to show that the Leicester was produced from crossing in the first instance, the Cotswold and Lincoln have been improved by the Leicester, and the Hampshire and Wiltshire have also been crossed and improved by the Southdown: and, as regards the latter, there is a doubt in some minds whether their improved chines and backs were not brought about by some such means. From all this it would appear the word "pure" is out of place when speaking of any breed, and therefore I prefer to use the term happily chosen by Mr. Robert Smith in his reports of the Royal Agricultural Shows at Chester and Warwick, viz., "the 'established' breeds." Having thus introduced the subject of crossing, I shall now proceed to speak of those sheep that have not yet arrived at the honourable position of being placed amongst the established breeds. Our friends the Shropshire men will deem it, no doubt, very impertinent of me in associating them still with Oxfordshire men; but I cannot allow them to part company until after the Canterbury Show, where, after repeated applications to that very useful, but irresponsible and slow-moving institution, the Royal Agricultural Council, they are at last to have a class to themselves. They will doubtless avail themselves of their improved position, and show it in such numbers and excellence that will entitle them for the future to take rank amongst the other established breeds of this country. There is no doubt that Shropshire, for very many years past, has possessed a breed of sheep peculiar to that county; the originals had a speckled face, and were larger and coarser than the present Shropshire breed. This breed has been established by a prudent selection of the breeding animals, and I learn from a gentleman who kindly favoured me with information upon the point that the late Mr. Meire was the first to improve upon the original type. This he did in the first place by the use of the Leicester; as their faces became white he would then have recourse to a Southdown or other dark-faced sheep. It was, however, left to the son to carry out and bring to a successful issue what the father had commenced, and Mr. Samuel Meire no doubt may be looked upon as the founder of the improved Shropshire Downs. We gather from his address to the Wenlock Farmers' Club that he accomplished this, not by reverting to any of the established breeds, but by using the best animals from his own large flock. I have received a somewhat different account of the origin of the Shropshire sheep. It is from a gentleman who is a native of the county, but has since left it, to manage an estate in another. I will read some extracts from his letter. He states: 1st. "Having been born in the county, and accustomed to the sheep as long as I have known any, there cannot be a question raised in favour of purity of blood. I have always regarded the Salop sheep to have had its origin from a breed of sheep known as the "Clun Forest,' but since its enclosure they have entirely disappeared; they were short-legged, square-framed, symmetrical sheep, with dark-brown face and legs, and occasionally small horns curling close into the head. 2ndly. The Ryeland sheep, which in early days was occupier of the common land in the neighbourhood of Bridgnorth and the southern districts of Shropshire; this was a larger animal, but not so compact as the 'Clun.' From these two parent stocks I have always understood the Shropshire sheep owed its origin by crossing chiefly with the Sussex or Hampshire Down, and then by any other animal that the breeder thought best suited either to increase size or remedy any other defect." The particular merit of Shropshires consists in their superiority over any other breed in their own county; they possess hardiness of constitution, excellent quality of mutton, and are prolific breeders. My friend also observes—The yearling wethers will cut from 5½lbs. to 7lbs. of wool, and if they have been well kept, will weigh from 16lbs. to 18lbs. per quarter; but they are not calculated to come out as yearlings, and are more frequently run on until the following Christmas or second year's clip, when they can be made 25lbs. to 30lbs. per quarter. Lately a very great change has come over the breeders of Shropshire; they have availed themselves of larger sheep of heavier fleece and earlier maturity, so that the only affinity they bear to the original Shrop are dark faces and legs; they now pride themselves in exhibiting some well fatted shearlings weighing upon times 22lbs. to 24lbs. per quarter, but this is not general.* The "Oxfordshire Downs" are what are commonly styled cross-bred sheep; but their patrons, in 1857, determined upon giving them a definite name. Hence their new title, the propriety of which is demurred to by some; for its only similarity to a Down is its colour, while its size and fleece partake more of the long-wool—important qualities, which have been long and carefully cultivated by the promoters of this breed. They were originally produced by crossing the Hampshire and in some instances South-down ewe with a Cotswold ram—most commonly the former, for it gave increased size—and the putting the crosses together: by constant attention and weeding, a most successful result has been accomplished, producing a kind of sheep that possess, with uniformity of character and hardiness of constitution, large frames, good fleeces, aptitude to fatten, and mutton of superior quality. It is about 27 years since they were first established in Oxfordshire; and Mr. Druce, in a letter to the Journal of the Royal Agricultural Society, in 1853, thus speaks of them: "It is now 20 years since I began crossing between the Southdown and Cotswold sheep, and, with the ordinary skill of sheep-farming, I find no difficulty to keep the form and size of the animal as it should be, the wool of a valuable quality, and not deficient in quantity; and I maintain that the good qualities can be better secured by employing the cross-bred animals on both sides, than by using the first cross." Mr. Druce has confirmed his statement by producing many extraordinary sheep at the Smithfield Club, where he has often been successful; also last year at Warwick, by taking the first prize in the old ram class, beating both West Country and Shropshire Downs. His son, Mr. Joseph Druce, after a lengthened experience, now writes of them: "This particular locality is situated on the edge of the Cotswolds, and embraces a large area of heavy mixed soils, abounding in springs near the surface, requiring much draining, and upon which it was found that the Cotswolds and Southdowns did not thrive at particular periods of the winter season, which suggested the admixture of two breeds. The flocks generally drop their lambs in the month of February, and at 13 or 14 months old they are ready for market, weighing upon an average 10 stones each, with a fleece varying from 7 to 10lbs. The ewes are good mothers, and produce a great proportion of twins." He also adds, "It is seldom this breed is attacked with giddiness or water upon the brain, so prevalent with some kinds." Another breeder, Mr. Hitchman, who has been one of the most successful exhibitors at Baker-street in the cross-bred class, having taken five 1st prizes in succession, besides nine medals and several 2nd prizes, states that it is 25 years since he began breeding this description of sheep, by crossing Hampshire Down ewes with a Cotswold ram, and considers them, for his neighbourhood, the most rent-paying sort; and believes there is no breed of sheep that will produce better quality of mutton, and more of it, than the Oxfordshire Downs. His tegs when shorn will average 11 stone, and his entire clip of wool about 7lbs. per fleece. I will only add one other testimony, that of a large breeder, Mr. Joseph Roberts, who says, "I have kept cross-breds, now Oxfordshire Downs, for 27 years, 19 at Waterperry, on very wet land, where long-woolled sheep could not be kept at a profit; we could make a fair return from cross-breds. I have been here (Caswell) eight years with the same sort, on land some persons consider calculated for Cotswolds, but I think otherwise. My wool weighed last year under 4 fleeces to the tod; I consider four to be a satisfactory average. I generally sell my tegs in April, averaging from 10 to 14 stones, a few even heavier; and my ewes this season weighed from 12 to 17 stones. I have no doubt Cotswold sheep can in their locality be brought to greater weight per sheep of both mutton and wool than any other breed, save Lincolns; but I question whether they can be made to produce more money-value as a whole flock than Oxfordshire Downs, allowing for the prolificacy of the latter, and I am of opinion that the produce from the same number of ewes will exceed in weight of flesh any other breed." The first Oxfordshire down ram exhibited at our royal shows was at Windsor in 1851, by the late Mr. John Gillett, of Brize Norton, who was a very successful breeder of them; but as no separate class is assigned them, they have but seldom competed until last year at Warwick, when there were 37 entries, thus bidding fair for a very strong competition when the Council of the Royal Agricultural Society determine to place them upon the same footing as their rivals the Shropshires. Until this is the case they will have to compete with an old established breed, the Hampshires, a state of things alike unsatisfactory to both exhibitors and judges. They have the last few years spread most rapidly in Oxfordshire and distant counties, and a very large number of rams is annually disposed of not only by private contract, but by auction at the Oxford cattle market, not a few finding their way into Hampshire and Shropshire. In a letter I received from Mr. Jonas Paxton, the well-known auctioner of Bicester, who sells by far the greatest number, he says, "Although I find an annual increase in the number produced for sale, I find more than a corresponding increase in the demand." I shall close my remarks upon this breed by quoting again from Mr. Robert Smith's report of the Warwick show, a very high authority upon such matters. He writes: "The Oxford downs date from the year 1833, when a neat well-made Cotswold ram was used with Hampshire ewes; at that period several breeders tried the same experiment, which by subsequent attention has resulted in the establishment of this rent-paying class of sheep;" and he adds, "Some excellent sheep of this breed have been shown at the various meetings: their career has been the most noticed in the yard of the Smithfield Club Cattle Show. As fat wethers they have again and again astonished the public, while the prize ram exhibited by Mr. Druce at Warwick went far to recommend them as male animals." I have gone more fully into the history and merits of the two last breeds, and have obtained more evidence from those who were well acquainted with them, for this reason: they have not been so long before the public, consequently not so well known. It does appear from the success which has attended the efforts of these breeders, the theory is correct, "that from a judicious pairing of cross-bred animals it is practicable to establish a new breed altogether." The breeders of these sheep, more particularly those of the Oxfordshire, contend that they can produce animals with more uniformity of character, a heavier fleece of wool, and greater aptitude to fatten than are to be obtained by crossing the established breeds, such as the Hampshire or Southdown ewe, with a Cotswold or other long-woolled ram. If it be true that the advantages I have indicated are realized, these breeds must be highly desirable, and perhaps not their least valuable quality is that the breeder who is anxious to obtain the same results as by crossing is not driven yearly into the market for his ewes. Probably some may be disappointed with my treatment of this subject; but after due deliberation, I resolved to adopt the course I have done, viz., to place the various leading breeds, with as much information as I could gain upon them, fairly before the Club, and leave the members to discuss their relative merits. I would observe that should a good discussion ensue upon this paper, I shall be amply compensated for any little trouble I may have taken. I hope I have not occupied so much of the evening as to prevent a full discussion of the subject, for I hold that quite as much information is conveyed to the Club, and through it to the public, by the remarks of subsequent speakers as by the introductory papers. In conclusion, I have to express my acknowledgments to those gentlemen in different parts of the country who have kindly favoured me with much information upon the respective breeds to which they have more immediately directed their attention.

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* The "Clun" cross Shropshires are to be found in the western and south-western division of the county, or "Corve Dale" district; although not so large as the Ryeland cross, they are of better quality and symmetry, and I am informed are decidedly the best specimens of their class. The "Ryeland" cross Shrops are peculiar to the south-eastern division of the county; they are larger, higher standing animals, with more open fleece, but not the aptitude to fatten, nor of so hardy a constitution as those met with in the eastern division. There is another family of these sheep lately advertised as the "Midland Downs," common to Staffordshire, produced by crossing the "Whittington Heath" sheep with the Shropshire; but since special prizes have been offered by Local Committees of the Royal Agricultural Shows for "Shropshire Downs," the breeders have dropped their previous title, and have made common cause with their neighbours; and to this class of sheep, which was somewhat larger, the prize was awarded at Warwick, Mr. John Coxon being the winner: the sheep was sold, to go to Ireland, for £100. The Shropshires have of late deservedly found considerable favour: it was at the Gloucester Meeting, in 1853, where they first commanded notice, some most beautiful animals being exhibited. At Warwick, last year, they showed in considerable numbers, and formed one of the greatest attractions of the show-yard.

Mr. EDMONDS (Trunkwell, Berks) wished to ask Mr. Howard a question. He spoke of a development of what he called the unestablished breeds. As regarded the Oxfordshire downs, he should like to know whether the lambs sold were the produce of the second crosses?

Mr. HOWARD: Yes.

Mr. COTHER (Middle Aston, Woodstock) said he was a breeder of Cotswold sheep, and he might add that in the capacity of an auctioneer he had had a great deal to do with the sale of Cotswold rams. Mr. Howard's estimate of the number of Cotswold rams sold in the course of the season was, he believed, far under the mark. In the last season his sales for professed breeders and for himself amounted to nearly 800, and he thought the sales by various other auctioneers would go far towards making up 3,000. There were, however, in addition a great number of rams sold privately for removal to various counties of England—the majority, he thought, going eastward. Cotswold rams were not unfrequently sold to Herefordshire breeders and for exportation at 40, 50, and even 60 guineas a-piece. To whatever extent crossing might be carried, he did not think the Cotswolds would, as a race, ever be severed from their native district, the Cotswold Hills. (Hear, hear.) They were not, as some people supposed, a large and unkindly breed of sheep, but had an extraordinary propensity to fatten. This year a nephew of his connected with Smithfield market sold a number of shorn ewes at 3 guineas a-piece, and a number of shorn tegs at 66s., and those were not bad prices. (Hear, hear.) He should be rather surprised to find other sheep yielding more per head; if that were alleged to be the case, he should like to see positive proof. He had never yet found anyone attempting to conduct a comparative analysis of what might be done with regard to the various breeds of sheep in this kingdom. That would, in fact, be a most difficult task for anyone to perform. In the first place, he must take great care that his premises were right, and that the sheep compared were each the best of its kind. Breeders of the different kinds of sheep must be convened together, and each must make his own choice of the animals on which the experiments were to be tried, the object being to ascertain the increase of meat derivable from a given quantity of food. He certainly agreed with Mr. Hobbs that much depended on climate, soil, and other circumstances connected with particular localities. (Hear, hear.) He himself happened to live only thirteen miles from the city of Oxford; and he had found that about five miles north of Oxford, Oxfordshire Down sheep almost entirely ceased, persons who had commenced breeding them there having discontinued it, and gone back to the old sort. For the vicinity of Banbury also, which was about twenty miles from Oxford, Cotswold sheep were very general. There was a chain of land running from about east to west, and embracing an area of about twenty-five miles long and fourteen or fifteen broad. In that district, the Oxfordshire Downs prevailed to a considerable extent, the soil being that which intervened between the flint and chalk of the Berkshire and Wiltshire hills, and the stone brash and red lands of Oxfordshire, Northamptonshire, and Warwickshire. This land lies north and south of Oxford. As regarded the spread of the particular breed with which he was connected, he would observe that about thirty or more years ago there was no auction sale of rams in Oxfordshire or Gloucestershire. He need scarcely add that the development of the race had been very rapid, and the improvement made in various breeds of sheep, through their exportation, exceedingly great. He thought that, unless they obtained more positive proof of the relative values of various breeds of sheep than had been given that evening, they would return home no wiser than they came. Gentlemen should not make statements unless they could support them by evidence. He was glad to perceive that the farmers of England were determined not to accept that which was not borne out by facts. Discussions of that kind were most useful, if they were conducted on right principles: if there were no attempts to deceive or to keep back the truth, they tended greatly to benefit the agriculture of the country.

Mr. J. Thomas (Bletsoe, Beds) wished just to state his opinion, as a breeder of sheep. A great deal had been said which was very much to the purpose, with regard to the crossing of different races. For some years he farmed in Essex; and there he found no sheep do so well as the Hampshire Downs. His practice was to purchase ewes of that breed, and put to them Leicester or long-woolled rams. The produce he sold in the London market as fat lambs, and the ewes when fat he also sold off. That had not much bearing, perhaps, on the main question under consideration, though he mentioned it because he was then much in favour of Hampshire Down sheep. When he had got into Bedfordshire, he bought a number of ewes, upwards of 200 perhaps, pure Leicesters, which had been bred in-and-in. These sheep being very delicate he crossed them with half-bred Lincolns, and this crossing answered very well. It gave the produce more frame and better constitution. After using the Lincoln rams for two years he crossed this produce with Hampshire Down rams, and though the rams were very good the result was not satisfactory. The sheep had lost that aptitude for fattening which in Bedfordshire and other Midland Counties (where the tegs are generally sold off fat at 15 or 18 months old) was so very important. The Hampshire Down cross would, no doubt, do better where they could be kept for a second shearing. He afterwards had recourse to Cotswold, and then to Shropshire Down rams. Through these crosses his sheep regained that aptitude for fattening which they had lost through the Hampshire Downs. He had now for the last two years been again using Lincoln rams to his stock of ewes, so that his stock of sheep may be considered a cross from beginning to end (Laughter). He greatly objected to the practice of breeding from the same flock. He himself never kept a ram to the same stock more than two years, and he found that by changing he obtained more mutton and wool. Mr. Howard had remarked that in breeding more depended on the male than on the female.

Mr. Howard: As regards size.

Mr. Thomas: His own experience did not tend to support that view. He thought the result depended chiefly on the female, though, of course, no one who had a good female would put a bad male to it.

Mr. G. Dobito (Lidgate, Newmarket) said he had come to the meeting prepared to advance similar views to those which had been propounded by Mr. Howard had the advocates of pure-bred sheep stated anything that was very strong in their favour. But Mr. Howard had so completely anticipated everything that he could say upon the subject, that he would not venture to trespass further upon their attention.

Mr. Corbet asked if there were not a good many blackfaced sheep in the Eastern Counties?

Mr. Dobito—Yes, a great many. They were originally a large-framed horned breed; but through judicious crossing with Sussex and Hampshire Downs, they had lost their horns, but not their size. They had lately been named the Suffolks, and, in his opinion, were a very superior breed of sheep, being larger than the Hampshires; but with a smaller and better-formed head.

Mr. Coleman (Woburn) said he had been a cross-breeder for the last seven or eight years, and the practice he had adopted was to use the long-woolled ram and the short-woolled ewe. By getting the best male animals his flocks were kept right, and he could depend upon what they would be. One great advantage of not going beyond the first cross was, the flock being of the short-wooled breed did not require so much food as either a long wool or cross-bred flock, and in winter, upon light lands, this was a great consideration. A few persons were trying the system of putting the cross-bred ewe to the long-woolled ram for the sake of getting a larger animal and a greater amount of wool; but he could not learn that they were likely to continue that practice very long. (Hear, hear.) The club were much indebted to Mr. Howard for the information contained in his paper; but he could have wished that gentleman had told them a little more about what he himself had done as a producer of cross-bred sheep; and he hoped that before the discussion terminated he would state his reasons for breeding from cross-bred sheep over and over again. He (Mr. Coleman) had migrated from Norfolk into Bedfordshire, where he found himself standing, as it were, between two breeds—the long-woolled sheep to the north and the short-woolled sheep to the south, in a district not exactly suitable to either one sort or the other. Now, were Mr. Howard to go to Norfolk, he would find himself with comparatively few followers; but in Bedfordshire the state of things was totally different, and he (Mr. Coleman) was obliged to own, though he did it reluctantly, that he was a convert to his way of thinking.

Mr. Thomas (late of Lidlington) wished to point out the fallacious idea which was entertained by some gentlemen, especially young farmers, that because certain breeds of sheep were of greater weight than others, they must therefore be necessarily more profitable. It had occurred to his mind, whilst listening to the present discussion, that a long series of experiments had been carried on by the late General Wemyss upon the Prince Consort's Flemish farm. Year after year General Wemyss had tried comparative amounts of food consumed by the pure-bred Southdown and the pure-bred Hampshire down; and he arrived at the conclusion that five Hampshires ate as much as 8 of the others. The extra weight, therefore, which so many Hampshire breeders prided themselves upon, as compared with the Southdown, might, after all, be obtained too dearly.

Mr. Fisher Hobbs (Boxted, Essex), having thanked Mr. Howard for his paper, said that the main feature of the question, so far as the public were concerned, was the best mode of producing the most good mutton for the consumer; but the point for the farmer's consideration was, what breed of sheep would pay him best per acre (Hear, hear); and whether the cross-bred short-wools or long wools of pure breeds were the best for that purpose. His own opinion was that climate, soil, and management must be the great criterion (Hear, hear). The first point which had struck him in Mr. Howard's remarks, was the statement that the cross-breeds of this country having much increased within the last few years, folding had become proportionably less general. If that were so, and the only merit of the cross-bred sheep was that of capability of fattening and early maturity, the question was whether the producer was not losing as much one way as the consumer was gaining the other. Mr. Howard had asserted that the practice of folding sheep had decreased since the introduction of the use of artificial manures. Now, if those manures were of the value which they were considered to be, and they were being introduced to such an extent that some persons laid out as much as £1 an acre upon the average extent of the farm, the increased production arising from their use ought also to give an augmented supply of roots, &c., to be folded or fed off upon the land. He was not inclined to think, therefore, that the folding of sheep had decreased in this country. Certain breeds were better adapted to one climate than to another, and at certain periods of the year were more useful. He had frequently seen, when a hurdle was left open in a sheep-fold, that the animals would by choice assemble there on a stormy night; and certain breeds brought up for folding in hilly districts were more valuable in those districts than either long-woolled or cross-breds. He had been a breeder of cross-bred sheep himself to some extent; at the same time he kept one or two pure-bred flocks on his farm. The more cross-breeding there was, the more would pure breeds be encouraged, and the more valuable would they become; but he contended that they must select their animals to suit the particular soil and climate. When he first began sheep farming he did not take this sufficiently into account. He resided in the county of Essex, and admiring the beautiful form and characteristics of the Bakewell Leicester, he procured a large flock of them, and was so fond of them that he continued to breed them for several years. He found, after keeping them a few years in that climate and folding them, that he could produce the Southdown wool upon the Leicester carcase according to climate, soil, and management. There was one class of wool according to the climate westward; and where there was a great deal of lime and chalk, as in the case of the Cotswolds, they would observe that the character of the sheep was affected by it. In cross-breeding, it was requisite to keep close to the pure blood on the side of the male animal; and he knew of an instance in which a merino ram was put with ten Leicester ewes, and the following year to a ram of Leicester breed, and the result was that six out of the ten produced lambs with a decided characteristic of the pure-bred Merino. From his experience, even with pigs, horses, and other animals, he always looked upon crosses with great fear, animals differed so much in the capability of crossing; and the great object of the farmer, after all, was to breed that class of sheep which would pay the most per acre.

Mr. R. Bond (Ipswich) considered that the question turned upon the *relative merits* of pure breeds and cross breeds. Speaking from his own experience, he might state that he started some years since upon a heavy land farm, and endeavoured to search out the most profitable system of sheep-breeding. In fact, he looked upon it, not as a matter of breeding or blood, symmetry, or size, but simply as one of profit (Hear, hear.) What he wanted was an animal that would return the largest quantity of meat and wool from a given quantity of food. Living amongst Southdown breeders he had adopted their opinions, and was rather prejudiced in favour of the Southdown breed. After giving the pure breed a trial, by picking out the best Southdown ewes in the flock, and hiring the very best Southdown tups he could meet with; the result was that he obtained a lamb which did not sell freely and readily in the market. He then made a change, still using the Southdown ewe and hiring a Leicester tup, and the change was decidedly advantageous. Afterwards he substituted a Cotswold tup, and the conclusion at which he had arrived from the experiment was that upon heavy lands the Cotswold was superior to the Leicester. But he did not stop there. He next used a Hampshire ewe and a Cotswold tup; and although he was not prepared to assert that it was the best cross that could be adopted, yet it had answered his purpose remarkably well, and every change had proved an improvement, in securing better and more paying lambs. Subsequently others had taken the experiments up where he had left off, and gone still further, especially one gentleman, his friend Mr. Fyson, of Barningham, who had resorted to the system of breeding from cross-bred animals on both sides, and had told him that he was better satisfied with the result by breeding from the two crosses than from the first cross. Mr. Fyson's flock consisted of half-breds from Leicester tups and Down ewes, and in a letter which he had casually written to him (Mr. Bond), he stated that his ewes had done particularly well this year; that from twenty score of ewes he had thirty score of lambs, and that he expected a score more. This evidently showed that the system was attended with considerable success. He further stated that the deaths among his ewes had amounted to only three. Mr. Fyson had had the same good success for many years past, though he farmed but two hundred acres of land, and his lambs were always excellent. The experiments which had been made by Mr. Lawes scarcely bore out the remarks which had fallen from Mr. Thomas as to the quantity of food consumed by different breeds, inasmuch as he showed that the Hampshire and Cotswolds produced a larger quantity of meat and wool from a given quantity of food than the Southdown.

Mr. Thomas asked if Mr. Bond was quite sure of that?

Mr. Bond spoke merely from recollection, but intimated that he (Mr. Bond) was correct. In this age of growing wealth, it might possibly be said that what was wanted was something fit for the epicurean palate of the rich—something that combined fineness of grain, age, and flavour; but his answer to that was, that the duty of the farmer was to look to the increasing population, and endeavour to feed them; for he had no doubt whatever that in the long run the multitude would prove the better customers. It would not by any means answer the purpose of the sheep farmer to keep his animals until they were four or five years old (Hear, hear); early maturity was one great desideratum for profit. It had always appeared to him to be a question worthy of consideration, whether more could not be done in the Eastern Counties in regard to the breeding of sheep: for he was quite sure that sheep was the most paying description of farm produce, and that prices would still hold out for mutton and wool. He had found cross-breeding more paying than pure blood, but he was quite convinced any good breed was far better than no sheep at all upon a farm.

The Chairman said, occupyiug as he did a clay farm, he had little to say on the subject under discussion. He merely brought a few sheep to fatten for the butcher. The conclusion which he should come to, if he were a breeder, was to stick to the pure breed; but buying as he himself did, he did not object to a cross animal. As regarded different breeds of sheep, he would ask what was the pure breed? It appeared to him that the pure breed was but a judicious cross from other breeds; and no doubt every gentleman adopted that breed or cross which was best adapted to his own district.

After a few words from Mr. Coleman, in explanation, to the effect that he approved of cross-breeding, from what was in fact the same family, though the breeds were district,

Mr. Howard, in reply, expressed his regret that Mr. Dobito, who, he believed, named the subject to the committee for discussion, had not favoured the Club with his views more fully upon it, for he was aware that he (Mr. Dobito) had met with considerable success in the crossing of sheep the last few years. In reply to Mr. Thomas (late of Lidlington), he observed that when speaking of Southdowns he stated that it was maintained by the breeders of those sheep that more could be kept upon the same acreage than of the larger breeds. He regretted that Mr. Thomas had not also gone more fully into the subject, for he knew that gentleman had had considerable experience in the breeding of sheep; for while at Lidlington he had kept successfully two flocks of the established breeds, viz., Leicester and Southdown. He agreed with Mr. Hobbs (he had said as much in his opening remarks) that very much depended upon soil and climate as to the breed that was the most suitable. Mr. Hobbs appeared to have some doubts as to the value of crossing. At this he was rather surprised; for he could not forget that those beautiful pigs, with which his name had been so long connected, were the result of crossing, and that too, as everyone knew, by a strain of Neapolitan blood. In answer to Mr. Thomas, of Bletsoe, he believed it was very generally admitted that the produce commonly partook of the size of the male. In adverting to Mr. Coleman's expression of regret that he had not entered into his own experience, Mr. Howard said he felt he should not have been justified in taking that course: he had purposely kept it in the back ground, not wishing in his paper to show a particular leaning to any breed. He had now no objection to state that he was strongly in favour of the cross-breds now known as "Oxford Downs," he had been very successful with them from the time he commenced business, and for "rent-paying" properties he would not change his flock for one of any of the established breeds.

Thanks were then voted to Mr. Howard for his paper, and to the Chairman for presiding, and with these acknowledgments the proceedings terminated.

The Over-Preservation of Game.—The paper read by Mr. Corbet at the March Meeting of the Club, having been revised and enlarged, is now published as a pamphlet by Mr. Ridgway, of Piccadilly, price 1s.

CENTRAL FARMERS' CLUB.

A meeting of the committee was held at the Club House, New Bridge-street, Blackfriars, on Monday, April 2; L. A. Coussmaker, Esq., in the chair. There were also present Messrs. N. G. Barthropp, J. Bradshaw, J. Cressingham, W. Gray, W. Fisher Hobbs, C. Howard, J. G. King, B. P. Shearer, Spencer Skelton, J. B. Spearing, James Thomas, John Thomas, and H. Trethewy.

The minutes of the last meeting were read, and the usual monthly statement of accounts received.

The following members were elected:

R. L. Cook, Hull.
J. Goodwin, Millman-street, Bedford-row.
T. Revis, Olney.
J. Sanderson, 13 a, Cannon-row, Westminster,

Seven other names were read for the first time.

The thanks of the committee were ordered for five parts of the "Journal of the Bath and West of England Society," presented to the Club by that society.

A letter was read from the Rev. S. Smith, of the Vicarage, Lois-Weedon, having reference to the May discussion meeting. This will be on the Lois Weedon system of wheat growing, and Mr. Smith wrote to invite a party of members of the club to inspect his crops, previous to the reading of Mr. Algernon Clark's paper. The committee directed their best thanks to be offered Mr. Smith, and a deputation was appointed accordingly to visit Lois-Weedon either the last week in April or the first week in May, as might be most convenient to Mr. Smith himself.

Mr. Skelton called the attention of the committee to the incredulity with which the statement made by Mr. Ald. Mechi at the February meeting of the Club as to his profits by farming during the past year had been received throughout the country. Mr. Skelton proceeded to move the following resolution, which was seconded by Mr. J. G. King, of Beedon, Berks: "That an official communication be forwarded by the secretary to Mr. Mechi, informing him that the committee were not satisfied with his statement at the February Discussion Meeting of the Club, as to the profits derived from his farm during the past year, and requesting that he would favour them with some more explicit and tangible account."

Other members of the committee considered that the adoption of such a course would only tend to attach undue importance to the matter, and the motion, on a division, was lost by one vote.

BATH AND WEST OF ENGLAND SOCIETY.

The monthly meeting of the Council was held at Waghorn's Hotel, Taunton, on Saturday, the 31st March last, John Sillifant, Esq., in the chair.

The following members were present: J. C. Mansell, T. D. Acland, W. E. Gillett, Jonathan Gray, John Daw, John Hooper, J. T. Davy, John Gould, John Belfield, T. Newman, John Widdicombe, R. H. Clarke, J. W. Walrond, M. Farrant, D. Adair, W. Thompson, G. S. Poole, E. U. Vidal, C. Bush, James Hole, R. G. Badcock, R. N. Grenville, E. S. Drewe, J. D. Hancock, R. K. M King, S. Pitman.

Several matters of an important character were brought before the board, but, after some discussion, postponed for future consideration.

Mr. W. Froude, of Dartington, Totness, was elected Assistant Steward of Implements.

The following gentlemen were elected members of the society: William Symonds, Milborn St. Andrew; John Seymour Titt, Milton Abbas; C. Vallack, Kingsand, Cornwall; John A. Smith, Bradford Peverell; James Stay, Templecombe, Wincanton; Samuel Worthy, Wincanton; John F. Hole, Wincanton; Charles Herridge, Wincanton; John Wadman, sen., Wincanton; Oliver Maggs, Wincanton; Mr. Hindley, Wincanton; Bernhard Samuelson, Banbury; John Shaw, Banbury; Levi Groves, West Kington, Dorchester; Richard Chandler Alexander Prior, Halse House, Taunton.

WILL WOOD OF THE FARM.

BY B. W. PEARCE.

The bright Spring days have come, Will Wood,
The cold, bleak weather is past,
The husbandman speeds his plough once more,
The Frost King's gone at last.
The fields have cast their mantle of white,
And are donning their carpet of green,
The cattle e'en now on the hill-side graze,
And the green bursting buds are seen.

My mind's eye wanders to the farm, Will Wood,
The farm with its meadows and trees,
Where in years gone by—bright boyhood's years—
Our hearts were light as the breeze;
The house by the road, where years it has stood,
Unscathed by the hand of decay,
The peach and the pear trees, 'neath whose shade,
We went in the sunshine to play.

The hand that planted them is cold, Will Wood,
And is laid 'neath the white marble stone;
But the trees he left bright monuments stand,
To tell of the patriarch gone.
That old well sweep you've taken away,
And a "new-fangled" pump, in its stead,
Brings to your hand the pure cooling draught
From the well that our good sire made.

And don't you remember the oven, Will Wood,
We built 'neath the buttonwood tree?
And how in that oven the apples we baked,
And none were so happy as we?
A score of years have passed since then,
But the oven remains there still,
Though the soft green moss now covers its sides,
That oven close under the hill.

There is one gentle voice now hushed, Will Wood,
That we all so delighted to hear;
Her form lies cold in the embrace of death,
That was wont the dwelling to cheer;
But her memory lives in the hearts of those
Who joyed in her presence then;
She'll mingle no more with the scenes of earth,
But anon we shall meet her again.

We're scattered all hither and yon, Will Wood,
We ne'er again shall meet
Around the board in the old farm-house,
With kindly words to greet;
But our hearts cling fondly around that spot,
Where we never knew aught of harm,
And we joy to grasp thy hard brown hand,
Will Wood of the homestead farm.

HOW TO GROW RED CLOVER ON CLAY LAND.

SIR,—A new reason was lately brought forward in the *Scottish Quarterly Journal of Agriculture* why clover (we suppose red clover here is meant) does not grow, or does not grow well, when sown a second time, unless a number of years intervene; that this is in consequence of the large quantity of old roots in the soil having a poisonous effect upon the recurring plant; that these old roots require to be rotted, and their components formed into new combinations, or evaporated, before a healthy recurrence of clover can be got; while cereals and other annuals, having much smaller roots, and these exhausted in maturing the seed, thence sooner disappearing or being absorbed, a recurrence can be much more frequent.

In science it has been a maxim that it is unphilosophic to bring in more than one cause for one effect. Here

> "I think there be six Richmonds in the field."

It is an acknowledged fact that certain kinds of plants extract certain kinds of nutriment from the soil (we need not state here whether of what is termed organic or inorganic matter), and that a previous crop of the same kind of plant, extracting a portion of some necessary nutriment, or nearly the whole in particular kinds of plants, renders a recurring crop of the same less luxuriant or even impracticable. Although the seeds germinate, the plant dwindles away in the braird, or, when larger grown, *plotts out*, as it is termed, from some disease induced by a want of some of the constituents necessary to healthy existence. It is also allowed that time, and exposure of the bare soil to the atmosphere, repairs what is lost, or increases the soluble quantity of the soil-supply necessary to the plant. Hence the great advantage of bare fallow, and of stirring the soil between plants with the hoe, which, although evaporating a considerable portion of the more volatile organic components of the soil, seems to render soluble the inorganic, and particularly to attract nitre from the atmosphere. Cannot all the apparently whimsical freaks of our red-clover history be rationally accounted for upon this one principle of exhaustion?

It is also a fact acknowledged by those who have made some inquiry in physiology, that almost every organism has its enemies or destroyers—in the case of plants generally minute parasites, many kinds of them only microscopic. These noxious organisms having greatly accumulated in the previous clover crop (living in clover), may manage to keep hold of existence by remaining in the seed or germ, or egg state, in the soil, or find a supply of food in the other crops barely sufficient to support existence, and only for a few years, till an early occurrence of another clover-sowing supply them with tender young plants, which they make their prey.

Another reason has been brought forward for the red clover sickness in land, though far from being proven—that plants generally throw out certain matter which they have absorbed, but which they cannot digest, or find injurious, and that this, remaining in the soil, is more or less poisonous to the same kind of plant recurring—in the case of some of the more delicate, such as red clover, soon recurring—altogether destructive.

Instead of theorising about the cause of the red clover sickness of land, which still remains doubtful, and may continue so, I think it more fitting the columns of the *Mark Lane Express* to describe how, in my own case, I succeeded in curing this sickness, and that thoroughly. I will be the more particular about this, although I state nothing new to the experienced farmer, as heavy crops of red clover is the most important part of high farming, as being the best paying crop of all when fat stock are so dear, and grain so cheap, and besides, not only as an enricher and cleaner of the land for the following crops, but also as the great parent of manure, especially when used in soiling cattle along with plenty of old straw. If properly attended to, and having the grass always fresh and green, stock in small sheds will feed fully as well as in the pasture field; while in plastic soils the keep for stock will be double. Red clover and annual ryegrass are much more productive when allowed to rise to their full flowering height, than when cut earlier or depastured. Annual ryegrass, a stronger plant than the perennial, may be known from perennial by the want of buds or eyes on the crown of the root.

In the case of some land belonging to the writer, in the Carse of Gowrie, where it is not found profitable to continue the clover-grass beyond one year, facts do not accord well with the new theory of old-root poison, and rather go to confirm the first doctrine of a defect in some food necessary to the health of the plant. At the time I began to cultivate this land—about 53 years ago—it had been brought, by a succession of six years' rotation and shallow ploughing, to be clover-sick, seldom giving a second cutting, except in scattered small patches, and sometimes very defective in the first. To correct this I broke up the fallow portions (during the first rotation) in the spring, with four horses in the plough, at a depth of from ten to twelve inches; and, in addition to the manure made in the place, some town manure, containing ashes, &c., to which the land had not been accustomed, was applied; at the same time giving it a fair liming, and changing the rotation to a seven-year shift, with two white crops immediately preceding the clover. The result was an immediate cure of the clover-sickness, and the clover crops have been for the last forty-five years unsurpassed in the country—never a failure of two heavy cuttings, excepting one season—a cold, very wet summer. During this time a little extraneous manure was sometimes given, and the whole clover crop was always consumed on the farm, most of it in soiling, which is by far the most economical in a plastic soil. Last season, so dry in this quarter, and the grass in consequence defective, except on good heavy soil, on this ground the annual ryegrass rose nearly to three feet, and, leaning over, allowed the red clover to rise above it, which last, also leaning over, allowed the allsike to rise through both—the whole composing a piece of resistance seldom equalled, and which below the feet felt like a thick mattress. Where some part of it was cut for hay, it had scarcely room to get *won*, partaking of the nature of three crops. Of course, this would not have been profitable in a wet season, as the ryegrass which at first leaned over would have fallen close to the ground, and rotted, while the clovers were rising, and would have required to be cut earlier. Here we may mention that good land in high condition produces a much closer crop, whether of red-clover grass, corn, or timber trees, than inferior soil. Many parts of the Carse of Gowrie (a silt formation, similar to that at the mouth of other rivers, and from which the sea has retreated many centuries) have become clover-sick chiefly where the soil is poorest, and where the former clover plants in the last rotation were rather minute, or even altogether wanting; while in the richer, deeper soils of our carse clay, under the same length of rotation, and where the roots last rotation were large, the ensuing clover crop is generally good.

It is amusing to listen to some of the old-school farmers, who after they and their fathers for more than half a century back have made hay of at least half their clover grass crop, and driven it away to a town at some distance, without bringing back any manure in return, complain that their land will not bear clover. They had killed the goose of the golden egg—had driven away from their land the peculiar principle of red clover, and are astonished that it is gone. This fact, along with the foregoing account of my own practice, I think is conclusive against the doctrine of the Scottish agricultural paper; and that enriching the land by town manure and lime, deep ploughing, consuming all the clover produce on the farm, and taking care that the crop among which the clover is sown be not too heavy, is the effectual remedy for the clover sickness.

In the fine calcareous loams of Poland, east of the Vistula, I have found beautiful fields of our common red clover, which had continued in sole and full occupation of the ground, giving luxuriant cuttings for ten and even more years in succession, the same as lucerne does in the best soils in the south of England, having a rubble limestone bottom. With regard to the interval of time required between the sowings of red clover in Scotland, my experience leads me to conclude that the longer time between, the better is the succeeding crop, other circumstances being equal. In my earliest remembrance, upwards of sixty years ago, in a part of this country where clover was nearly new to the soil, and the soil good clay, the finest clover was obtained under a six-year rotation shift. This would infer that it is merely an exhaustion of the soil which constitutes the clover sickness.

In closing, I may remark that lime or calcareous earth is a requisite in the soil for the luxuriant growth of clover. We have found this a *sine qua non* in Germany. The soil of the greater part of Scotland is defective in calcareous earth, much more so than most of the soil in England. This might be expected from the rock basis in Scotland being generally very old formations, most of them defective in lime — belonging to periods when there appears to have been less calcareous matter on the surface of the earth, at least in the solid form. The greater part of the calcareous rocks of more recent formations, and which abound in England, seem to have been extracted by shell-fish, and fish of thick bony scales, from the seas of ancient time, which appear to have had much lime in solution. There is another reason why lime is more required as a manure in Scotland than in England. It tends to prevent the formation of peat, and acts to reduce this obstinate encroaching subject to a manure when formed, to which formation Scotland, from the colder and moister climate, is more disposed than England, while at the same time it hastens the maturity of the crops, so important in the backward climate of Scotland.

PATRICK MATTHEW.

Gourdie Hill, Errol, March 26, 1860.

A SETTLER!

The following challenge appeared in the *Times* on Tuesday, April 10 :

TO THE EDITOR OF THE TIMES.

SIR,—Every man of intelligence appreciates Mr. Mechi's efforts in the cause of agricultural progress, but thousands question the soundness of Mr. Mechi's conclusions upon his agricultural profits.

The following balance-sheet is taken from Mr. Mechi's own published statements :

Dr.	£	s.	d.
General expenses at £7 9s. 8d. per acre ..	1273	3	4
Annual interest of capital permanently invested (see "How to Farm Profitably," page 34), purchase of Tiptree-hall estate, £3,250, at 3½ per cent..............	113	15	0
Draining, fencing, levelling, ditching, and roads, £2,200, at 5 per cent..........	110	0	0
Barns, stabling, tanks, sheds, yards, &c., £2,000, at 7½ per cent., including repairs	150	0	0
House and offices, £1,000, at 7½ per cent., including repairs	75	0	0
Machinery, implements, cooking apparatus, &c., £500, at 7½ per cent............	37	10	0
Irrigation apparatus, £600, at 7½ per cent.	45	0	0
Interest on tenant's capital, £2,380, at 5 per cent........................	119	0	0
	£1922	8	4

Cr.	£	s.	d.
By produce sold	1884	0	0
To loss	38	8	4
	£1922	8	4
Loss as landlord and tenant............	38	8	4

If Mr. Mechi will kindly consent to submit his entire agricultural account, from the first purchase of the Tiptree-hall estate to the present time, to three competent and impartial men, I will guarantee to pay £100 to the Agricultural Benevolent College Fund in the event of their pronouncing that Mr. Mechi has made one sixpence in profit during his 17 years' experience as landlord and tenant.

With every feeling of just appreciation and of personal esteem and respect for Mr. Mechi,

I am, sir, your obedient servant,

Ipswich, March 30. ROBERT BOND.

Mr. Mechi's reply did not appear until the following Saturday; when this was the unsatisfactory and evasive answer he offered :

TO THE EDITOR OF THE TIMES.

SIR,—I have read several letters in your columns objecting to my balance-sheet. I have long since ceased to expect that I can convince people against their will. When I published my first balance-sheet, showing an apparent loss, everybody believed in it, and agriculture rejoiced. Now that the fruits of improvement have resulted in a good profit, agriculture is unhappy and full of disbelief.

I am not surprised at this, because the history of progress has ever been one of warfare against old-established prejudices. I shall nevertheless continue, by every means in my power, to stimulate our national agricultural improvement, knowing that in so doing I am supported (and a great comfort it is) by the good wishes and approbation of wise and thoughtful men.

We certainly should all regret that in this age of intellectual progress so many can be found who doubt the necessity for, and profit of, such investments as the drainage and deeper cultivation of our wet, stiff, cold clays, the better shelter for our live stock, the economic use of steam machinery, and many other things which cannot be carried out without a considerable investment of capital. The miserable condition of our vast expanse of those clays (15-16ths of which, according to Mr. Bailey Denton, are still undrained), is painfully visible from every line of railway, binding the tenants in poverty, humility, and discontent; and yet I am told, over and over again, by such practical men, "Water won't go through our soil."

I pass frequently by a stiff-clay undrained farm which has had five tenants in five years, and has either ruined or impoverished every one of them; and yet the one remedy wanting—deep drainage—is still unsupplied. Seeing, then, a multiplication of such apathy or miscalculation on the part of landlord or tenant, or both, am I to be blamed for awakening public attention for such sins of omission, so detrimental to the community at large?

My conscience tells me that I am not to blame.

I can, therefore, afford to pass by without anger the petty nibblings of fractional or prejudiced objectors.

I do not consider it necessary to vindicate the general truthfulness of my statements.

I am, sir, your obedient servant,

J. J. MECHI.

Tiptree-hall, near Kelvedon, Essex, April 12.

Can any one doubt, after this, but that Mr. Mechi simply makes the farmers of England, and Tiptree-hall, the stalking horses for his more profitable concerns in London? As we said a fortnight since, surely we have something better to do than following such a a will-o'-the-wisp any further.

CROYDON FARMERS' CLUB.

The members of the above club met at the King's Arms Hotel, on Saturday, March 10, R. W. Fuller, vice-president (in the chair).

Mr. Charles J. Hunt, of Mitcham, introduced the following subject for the evening's discussion, viz. :—

"MEADOW LAND AND ITS CULTIVATION."

He said, Mr. Chairman and gentlemen,—The subject I have ventured to bring before your notice this evening, though perhaps not fraught with that importance which other subjects have possessed that have lately been discussed here, yet I think it not wholly devoid of interest to many of you present, and in addressing you I feel I must crave your indulgence to one who feels himself so unfitted to address a meeting composed of so many eminent agriculturists, but who will humbly, faithfully, and practically lay before you facts which he himself has proved. Although strictly speaking this is not a grazing country, the character and formation of the soil precluding its general adaptation to pasture, yet at the present time, when corn is producing such unremunerative prices, and stock bringing in remunerative returns, it well becomes you to consider whether the addition of more meadow ground (when practicable) to your farms would not be rather a boon than a disadvantage. Where is the farmer, who, through the past winter, has been fortunate enough to possess a good stack of meadow hay, but has looked upon it with pride, and felt that he has indeed had a friend that has greatly assisted him in the hour of need, and in a great measure mitigated the difficulties he has undergone? and they have been no light troubles which he has had to contend with, this past winter. His winter supply of swedes and turnips, which he had calculated upon for his sheep, has, by a season unprecedented for years, been partially, and in many cases all but wholly destroyed, whilst his spring dependence, such as rye, winter barley, tares, &c., is unusually backward, and in many places only fit to be ploughed up. Well, then I say when he has had such a friend that has not deserted him, but in proportion to the demands made upon its bounty, he ought to cultivate the acquaintance of such a friend, and take care constantly to provide himself with a supply of such friendship. And surely a good stack of meadow hay is as great an ornament to the rick yard as a stack of corn or any other agricultural produce, and a good meadow as picturesque an object as any other field; and yet how many farmers scarcely ever bestow a thought upon their meadows, unless it be for a makeshift, when their turnip fields are too wet or feed runs short! It is then the poor meadow is thought of; but as to its ever having its health recruited with the invigorating produce of the farm yard, or the beneficial tonic of artificial manures, it is out of the question; and yet the propriety of properly cultivating meadows is unquestionable, and is as indispensable to good farming as the cultivation of any other crop, and the produce of them as important to the farmer. Your root crops may be lost to you in a variety of ways, the fly or blight may take your early plants, or the mildew, as in the season just past—the atmospheric influences destroy those arrived at maturity; but your hay is not liable to such changes: once get it properly secured in a stack, and nothing (save the ruthless hand of fire) will affect it, let the season be what it may. With these prefatory remarks, I now come to the important part of the subject, and that is, the cultivation of meadow land. With the preparing and laying down ground for pasture I shall not touch upon: I leave that for a more able pen to descant upon, and I trust some gentleman present will ere long give us a paper upon it. I have now only to do with ground which is already under cultivation, and in so doing I will divide my subject under three heads: 1st, The manures suitable for meadows, and the method and time of applying them; 2nd, The cultivation of the ground for mowing; and 3rd, The cheapest and best method of making hay. And now, gentlemen, on the subject of manures, and perhaps it may be a little out of place to put the subject of manures before the cultivation, but I think it is right here, as it is now the time when most artificial manures, and very often dung is applied, and, of course, this is done previously to the rolling, &c., and, therefore, I have introduced it first. Many of you may think, "Ah! now we shall have a long tale about manures." But you will not be troubled with any such thing. I am not going to give you a long, theoretical dissertation upon them, but a plain illustration of facts—and facts speak louder than words—and it is facts substantiated by practice that I am now going to lay before you. The manures most generally used for meadows are dung, bone dust, guano, and superphosphate; but the oldest and most universal of them for meadows is dung, and certainly no one will deny its efficacy if applied properly and at the right time. An old-fashioned system, still adopted by many, is spreading the dung on the ground directly the hay is removed. I have tried that system, and certainly do not hold with it; it is open to two objections. First, it is not economical. By spreading it so soon you lose a great deal of valuable feed, and at a time when much wanted, for stock will not feed for some time after the dung is applied, and then they will not feed freely; and certainly the feed for the first month or so after mowing is the time most required for stock, there being then no stubbles to run upon, or any other feed of importance. And, secondly, it is injurious to the next year's crop. The grass growing freely, from the combined influence of the dung and the warm growing weather, gets coarse and rank; consequently, stock does not feed it close as they would otherwise, and the bottom getting mossy and thick by the spring of the year, through not being properly fed, the young grass is prevented getting through it, and the scythe cannot get to the bottom of it; so that you lose an inch or more in depth of hay, which is certainly a loss to the farmer. As I before stated, I tried the system as an experiment, and found it just as I have stated to you, and I have never done it since. My usual plan is to begin dung-carting about October, and get it all on before Christmas; it then has all the benefit of the frost and severe weather, which makes it decay more rapidly, and tends, in a great measure, to preserve the young grasses from the inclemency of the season; and here let me say that I prefer the dung for meadows just as it comes from the stable or yard (with the long straw taken from it), without any fermentation, as the dung from stables, or from yards where stock has any hay for feed, contains a small amount of clover, and other hay seeds, which are destroyed by fermentation, but which, by the dung going out fresh, vegetates, and so replenishes the meadows with plants, and thus saves the expense of sowing seeds, which is required; and, likewise, the fresh dung restores to the ground so much more valuable manuring elements, than with the rotten dung which is usually applied. Ordinary farm-yard and stable dung contains a large amount of nitrogen, which, during the putrefaction of the dung, changes into ammonia; and other volatile combinations, such as sulphur and phosphorus (or sulphureted hydrogen), are likewise generated; these, in the process of putrefaction, escape into the air, and are thereby lost to the ground to a great extent (for Nature performs what man will not do, by restoring to the ground, in every shower of rain that falls, much of the gases and volatile salts which we allow to escape into the air); whereas, by putting the manure fresh on the ground, putrefaction takes place in the earth, and the earth, like all other porous bodies, has the power of absorption, and it is by this power that the gas and other volatile substances set at liberty, are retained in the soil until taken up by the roots of the plants. But where it is not practicable to supply fresh manure, either from want of a proper supply when required, or other causes, then the farmer should take care that he loses none of the valuable portion of the manure during its fermentation; the prevention is very simple, and yet how many neglect the means, and not only injure their farms, but also their pockets! How often do we see a large heap of dung smoking, and filling the air around with a disagreeable vapour, and affecting the olfactory nerves of every passer-by, unless it be the farmer himself, and he will exclaim, "Oh, I like that smell, it shows it is good." What is the cause of that smell? Why, the evaporation from that heap, of the gases, and the real wealth of that heap. Aye, gentlemen, and the evaporation, too, from that farmer's pocket, of a great deal of his wealth, and I will try and explain it to you. One ton of fresh dung usually contains 8 lbs. of nitrogen, that ton, by lying some little time, say two months, will reduce to 15 cwts., and if it comes to lie till thoroughly decomposed, will be reduced quite half. Now, from the first loss in the bulk there will be at least from 2 to 3 lbs. of the nitrogen lost, and during the last evaporation the 10 cwt. will be found to contain not above 2 lbs. of nitrogen, and very often nothing at all. So that although a load of the last-named manure may seem to be of much greater value to the ground, and will, notwithstanding the loss it has sustained, do more good, yet, putting the value of the one with the other, which is the cheapest? Suppose a load of fresh manure to be worth 5s., then a load of the other will cost 10s., since two loads of the fresh are required to form one of the decomposed, without any calculation of the value of the loss sustained by the volatilization of the enriching and manuring elements. But many of you may say, "It is all very well to talk about such things, but how are we to prevent it?" Gentlemen farmers, who have plenty of money, may do many things; but the farmers cannot afford to be at all this expense and trouble with their manure. Ah, gentlemen, if you only knew what you lost in the course of a year you would be astonished, and which might be avoided by a trifling outlay. There are several simple means, and I will give you two or three useful methods, and one of the best is to put your dung into a heap and keep it close together, and as soon as it begins to steam take some sulphuric acid, and mix at the rate of one pint to about 15 pints of water, and with an ordinary watering-pot well sprinkle the heap, which will soon stop the fermentation and fix the ammonia in the heap, and prevent its escape, besides greatly adding to the value of the dung, as the sulphuric acid with the ammonia forms sulphate of ammonia, a manure which every practical farmer well knows the value of. Gypsum, likewise, sprinkled in layers with the dung will also answer the same purpose, the sulphuric acid in the gypsum acting the same way; and another way which it is in the power of all without any expense except labour (which many of you do not estimate, although I think differently, as I think it the dearest part belonging to a farm) is to put a good covering of mould over the mixen, or, what is better still, in each yard in thickness of the heap lay on a thin coat of mould. The advantage of this is easily seen: when the dung begins to ferment, the gases rise, and are thereby absorbed by each layer of earth, so that you get your dung more even in quality than when your mould is all on the top, and there is no fear of any loss by evaporation. Such, gentlemen, are a few simple practical means of enriching your manure, or, I should say, preventing the deterioration of it, and they are within the reach of all of you, and I trust that many of you who do not avail yourselves of these remedies now may ere long do so. And now, gentlemen, I come to the subject of artificial manure in connection with meadow land, and I must say, from my connection with them, I naturally feel some little diffidence in entering upon the subject; yet knowing the indulgence shown by you to all who address you, and the kind spirit in which their communications are received, I am certain you will not impute to me any other motives but those of a desire to be instructive to you; and in the first place, with respect to artificial manures, let me impress upon you the absolute necessity of having them genuine, for if there is one class of persons more systematically swindled than another it is the farmers. Whether it proceeds from their well-known honesty of character, which being so honest themselves makes them unsuspicious of others, or from their hospitality and kindness of disposition they are more easily beguiled than others by the specious tales of the swindling dealer, I know not; but certain it is, the extent to which they are plundered is enormous by the substitution in their manures of substances wholly foreign to the genuine article. Although, as I have stated, no one will deny the virtue of good dung for meadow land if properly applied; still, like all good things, too much of one thing sickens and cloys; and ground, like ourselves, requires a change, and meadow ground perhaps more than arable, for in the former there is no change of crops to restore to the land what is taken from it, while in the latter each succeeding crop restores to the soil in a great measure what the other has deprived it of. Hence in meadow land the necessity of a change must be greater. Let us look at the chief constituents of meadow hay, and I think you will then be better able to see the necessity of a change of manures. One ton of hay, with the aftermath, on an average, contains 30lbs. of nitrogen, 35 of phosphoric acid, 36 of potash, 18 of lime and magnesia, and 42 of silica; while one ton of wheat and its straw contain only 22lbs. of nitrogen, 10 of phosphoric acid, 12 of potash, 8 of lime and magnesia, and 40 of silica. Oats, with straw, about the same, and barley a little more in nitrogen and potash than wheat and oats (cf course these constituents vary according to the soil); so that you see meadow hay contains 50 per cent. more nitrogen, 300 per cent. more phosphoric acid, 300 per cent. more potash, 200 per cent. more lime and magnesia than wheat and oats, and nearly the same per-centage more or less than rye and barley. Well, then, we see that hay takes from the soil more of its important constituents, viz., nitrogen and phosphoric acid, than any of the cereals, although not quite so much in nitrogen, but a considerable deal more in phosphoric acid than peas, beet, or potatoes. We need not wonder that meadow ground, by its exhaustive culture, when not properly supplied with suitable manures, so soon becomes infertile. Hence the necessity of supplying to the soil such artificials which contain the manuring elements of which it has been deprived, and which dung alone cannot bestow, however plentifully it may be supplied, and I will give you an illustration. When we took our farm at Mitcham, six years ago, of which there are forty acres of meadow ground, there were thirty acres of it wet and cold soil which had scarcely ever seen any manure, but a little mud from the river Wandle, which flows through it, and consequently, as you may suppose, from being constantly mown, was in a very poor state; the other 10 acres, which lies high and dry, had been constantly dressed, and the year we went there mown the second time. Well, I fed with stock from November to the end of February, and then left it for mowing without putting any manure upon it, as it had been dressed the previous year. When it came to be mown I was surprised at the lightness of the crop. Indeed it was scarcely worth mowing, for out of the 10 acres I only carried 10 cart-loads of hay; about four loads of truss-bound hay about the month of August the same year. I dressed it with 25 loads of London dung an acre, and I thought, "Well, next year there will be something worth carrying." Well, the next season came, and certainly I did find an increase, but very slightly, although it was a growing time. There was an increase of about eight cart-loads, or about two loads of truss-bound hay extra, and which I thought a very poor return for the outlay expended. I spoke of it to a gentleman who lives near me, and who came to look over the place one day with me. He said he could not understand it that such good ground (and it ought to be good, seeing that he paid £5 an acre for it), and which had been so well manured, should not grow more. I then thought something must be wanting in the soil, and that it must be from the constant application of one manure that must be the cause; so in the succeeding February I put on five cwt. of fine bone-dust an acre, and then I found that I was right, and that I was at last repaid for the present outlay and the preceding one too, for I had an abundant crop; in fact, where I had previously paid 5s. an acre for mowing, I had to pay 9s., and it was well worth it, for we carried from that field (which had been reduced since the previous crop by the railway passing through it to about nine acres) 36 van and cart-loads, or something like two loads of truss-bound hay per acre, besides plenty after-feed, up to the next spring; the next year, therefore, I did not manure it, and I had about the same crop, and by dressing it with dung and bones alternately with one season after them manured, I had an abundance of hay and of first-rate quality; and so with the other 30 acres I pursued the same system, with the exception of now and then giving them, in the place of dung, superphosphate and gypsum, just as stimulants, when the season is cold and backward, and I have now about 150 loads of hay (old and new), which I can safely show against any in the county, and there are gentlemen here who can authenticate what I say, and which has been entirely produced by the judicious application of manures, for I have not sown any seeds beyond a few pounds weight on some two or three acres, and although previously the hay was comparatively worthless, I made during the Crimea war £5 15s. per load upon the place, and sold it to dealers, and I am now making 90s. per load for hay which a few years previously would not have fetched more than £3 per load. But some of you may not mow your meadows, but only graze them; you may therefore say "What do I want with artificial manure, when I do not exhaust my ground by mowing?" I know that many farmers hold it as an opinion that by feeding a meadow one year after it has been mown, that it is as good as a dressing of manure, and that they will have an abundant crop next year. This, gentlemen, is a great mistake. Although you do not injure the land so much by depasturing as by constantly mowing it, still your ground wants manuring; for, in every head of cattle (be it what it may), that you graze in your meadows, your ground parts with so much of its phosphate in the food consumed by that animal, which tends to form its bones, sinews, &c., and the richer the feed in phosphate and nitrogen the stronger and better will be that animal. Then if we look at the constituents of the excrements of those animals so fed, we shall find that they return to the soil a very small proportion of what they take from it. While 1,000lbs. of such excrements contain only 4lbs. of nitrogen, three of phosphoric acid, and 4lb. of lime, we find that the same proportion of bones of such animals contain 50lbs. of nitrogen, 240 of phosphoric acid, and 330 of lime, which has been abstracted from the soil at one time and another. Therefore it shows the absolute necessity of restoring such elements again to the soil if you wish to fertilize your land, and raise fine and healthy stock. In concluding this part of my subject, I cannot do better than read to you an extract from the *Farmer's Magazine* of January '59. It is as follows: "It was a wise saying that he who made two blades of grass to grow in the place of one, was a benefactor to mankind. The Cheshire dairy farmer, by the free use of finely-crushed bone manure laid on his grass lands, makes his farm, which at one time before the application of bone manure fed only 20 head of cows, now feed 40!" In Cheshire, two-thirds or more, generally three-fourths, of a dairy farm, are in permanent pasture, the remainder in tillage. Its dairy farmers are commonly bound to lay the whole of their manure not on the arable, but on the grass land, purchasing what may be necessary for the arable. The chief improvement, besides drainage, consists in the application of bone manure. In the milk of each cow, in its urine, in its manure, in the bones of each calf reared and sold off, a farm parts with as much earthy phosphate of lime as is contained in half a cwt. of bone dust. Hence the advantage found in returning this manure by boning grass lands. It is considered that draining and boning four acres of land will yield such an additional quantity of grass that each acre so treated will summer one cow. But if land be not boned and of similar quality to that which has been boned, two acres are generally, in Cheshire, required to keep one cow in summer. The quantity of bones now commonly given in Cheshire to an imperial acre of grass land is about 12 or 15 cwt. This dressing on pasture land will last seven or eight years; and on mowed about half that period. But the grass land once boned and kept under pasturage is never so exhausted as to be as poor as it was before the application. All the better sorts of grasses—cow grass, clover, and others—spring up in the place of the more worthless. The example in Cheshire by its dairy farmers in using so largely bones on their grass lands, their application of bones as top-dressing to grass, has been found so very beneficial as nearly to double the number of cows kept in that country; and the weight of cheese having also been nearly doubled within a few years from thus boning their grass lands, ought to encourage all dairy farmers to imitate this management of boning their pastures. Next to dung and bones for meadow land is guano. What good wines are to the constitution, so are the first-named manures to the ground by nourishing and strengthening it; and like brandy is to the constitution, so is guano to the soil. Guano is purely stimulating, and should be used for meadows in small quantities, and not too frequently, but as necessity requires to make up any deficiency arising from a wet and cold or backward season, and when it has been late or too closely fed. It should always be used mixed with other things, such as bone dust, gypsum, salt, soot, or earth, and perhaps there is nothing better than simple mould as an admixture, for it acts as an absorbent by taking up the ammonia which otherwise evaporates in the sowing; and, again, by preventing its injurious effects upon the grass, for pure guano is very rich in ammoniacal salts, and easily corrodes the roots of the plants, especially the young and tender ones. Therefore it should never be sown in dry weather; but by being mixed with earth this is avoided, and injury to the plants is no longer to be feared. It is my opinion from experience, that guano should never be used for meadow lands where the soil is light and dry, as I believe it is more injurious than beneficial. But on cold wet soils, there it is specially adapted, the moisture of the ground tending to destroy its corrosive influence, and likewise absorbing the ammonia, although here it should not be used too often, and whenever it is used, it should always be followed by dung or other manures; that is, supposing guano to be used for this season, then next season it should be followed by dung or bone dust, &c., as the forcing properties of the guano tend greatly to weaken the roots of the plants by the rapid development of the leaves and stems. I have tried it several times on meadow ground, and always find it answered best for wet soils and in wet seasons. The last time I used it I put it at the rate of three cwt. per acre on part of a damp cold meadow, and certainly the grass grew as fast again on that part, to what the other portions of the field did which were boned and dunged. But when it was mown, I found the grass wasted more in the making of the hay than the other grass, although the after-feed continued to grow luxuriantly. In the next year, however, it was plainly visible where it had been: in the grass-cutting season it was neither so long nor so thick as the other portion of the field, showing that the forcing power exerted the previous year had weakened the roots for the succeeding year's growth; whereas at other times, when it had been succeeded by dung or bone dust, the luxuriance of the hay was increased. I need not trouble you with the constituents of guano, as I dare say you are well acquainted with them already, but will, therefore, proceed with the other manures adapted for meadows. Superphosphate of lime is a manure which is rapidly rising into repute as a fertilizer of meadows: until within these last five years it was almost wholly confined to root crops and cereals: but from successive experiments made, it is fast becoming a favourite for meadows. To a great extent it resembles guano in its effects, being a stimulator, and is generally used for the same reasons, although slower in its action, but is more enduring, provided it is of good quality; and here let me state, that of all manures sold to the farmer, there are none so adulterated as this; its peculiar composition affording such facility for adulteration, while the means of detection are so difficult, unless by chemical analysis. There are thousands of tons sold every year which are not worth the labour and trouble of carting on the field. Indeed the farmer would be better without it, for he not only sustains a loss in the money paid for it, but a still greater one in the loss of his crop (Hear, hear), and, of course, in the loss of his cattle (Hear, hear.) A great deal of the superphosphate now sold is only made from mineral substances and other rubbish, the phosphates of which are insoluble, instead of being made from bones and other nitrogenous substances, and sulphuric acid, which are rich in soluble phosphates, and the unprincipled vendors of them reap a golden harvest at the expense of the victimised farmer (a laugh.) But they should always take care to get this article of those upon whom they can rely; of men whose reputation is unsullied, and who have a character to lose, and not of those who have no character to lose, and no reputation at stake (Hear, hear.) But when it is applied in a genuine state to meadows its effects are plainly visible for the next season, and the grass always grows kindly afterwards, for if you look at its constituents, we shall plainly see it must be of advantage. When bones and sulphuric acid are brought into contact, the lime of the bone earth combines with the acid and forms sulphate of lime, which makes the gelatine soluble in the earth; and by this treatment the two most valuable constituents of the bones, namely, gelatine (which is rich in nitrogen) and the phosphoric acid are brought into such a soluble state that they immediately act upon the soil, and give their manuring elements immediately to the plants. I have frequently used it at the rate of 5 cwt. an acre. I am now dressing some five acres of pasture with it. I have always found it very beneficial; the grass does not waste so much in the process of haymaking as with guano, neither is the ground so deteriorated in the next season. Gypsum is another manure which is largely used in some counties for meadow land with beneficial results; it seems quite a specific for grasses and clover, as it invigorates their growth in a surprising manner where properly applied and the soil suitable. Here it is just the reverse to guano and superphosphate, being more beneficial for light and dry ground than wet and cold soils; indeed, on the latter it very often proves injurious. The constituents of gypsum are lime and sulphuric acid; thus, 100lbs. of it generally contain 33lbs. of lime, 48 sulphuric acid, and 19lbs. of water. In all plants we meet with lime and sulphuric acid, and therefore it shows that they are necessary to vegetatble growth, and if a soil is deficient in them it will be infertile. Now, on such a soil gypsum exerts a most beneficial effect; but if they are already in the soil, it will be of no value. This can easily be known by analysis of the soil, or by sowing a portion of the ground with gypsum. Why it acts so specifically upon clover and grasses has not been yet clearly decided; some have stated that they contain so much more sulphur than the cereals, and others by being supplied with gypsum it promotes their growth; but chemical analysis does not always prove this, although it has often been found that hay has contained four or five times as much more sulphuric acid where gypsum has been applied than where it has not. My belief is that gypsum acts far more through its sulphuric acid than through its lime, for in all soils there is always a portion of lime, though not sulphuric acid; and in the air there is always a certain amount of ammonia; therefore, I think the sulphuric acid acts as an absorbent of ammonia by drawing it to the earth, and likewise as a producer of ammonia by setting it free from the insoluble humus of the ground. It is an old-fashioned theory that when gypsum is once used it should never be applied again; but this is a mistake. I think that at least once in seven years is often enough for meadow ground, and the best method of using it is to sow it early in the morning, when the dew is on the plant, and in showery weather, for it is soluble in water (about 450 parts of water take up 1 part of gypsum), and will not act unless it has its assistance. Although its action, like guano, is stimulating, yet it will last several years, and may be easily traced. Its effect, where suitable to the soil, are astonishing; in a few days the grass will improve in colour, and assume a very healthy appearance, the leaves and stalks rapidly increasing; and in haymaking, they do not shrink to the extent that the ordinary-grown grass will, while the after-grass still grows vigorously, and the meadow continues to grow well for years. Such, gentlemen, is a brief outline of the various manures best adapted for your meadows, and my plan for using them, together with their cost per acre,is somewhat as follows: Dung, 25 yards per acre, put on between the months of October and December; bone dust from October until March; guano and superphosphate in April, and gypsum in the early part of May, and the cost would be somewhat as follows—

	£	s.	d.
Dung, 25 yards per acre, 3s. per yard..	3	15	0
Bone-dust (fine), 5 cwt. per acre, at 6s. 6d..............................	1	12	6
Guano, 3 cwt. per acre, at 13s.......	1	19	0
Superphosphate, 5 cwt. per acre, at 6s.	1	10	0
Gypsum, 5 cwt. per acre, at 1s. 6d.....	0	7	6

It is not my intention to state to you which I consider the best and cheapest. I have given you the amount generally used, their nature, and their cost, and I now leave it for you to decide for yourselves which you prefer, and which is the best adapted for your soils. And now I come to the second part of my subject, namely, the cultivation of the ground for mowing. My plan is to well bush-harrow the ground about the end of March or early in April, but this depends on the season. I do not hold with it earlier, as I think when it has been manured you remove the dung from the young grass and injure the pasture by the cold winds and frosty nights which are then so prevalent. I then pick off the large stones and other rubbish, and then roll it twice up the field one way and across it another. I object to early rolling, unless followed by it later in the season, as the worm-casts again rise, and prevent the scythe from cutting freely, and, of course, occasion a loss in the crop to second cutting. I am entirely averse to believing it the most injurious and unprofitable method of treating meadow land. The third part of my subject, viz., the best and cheapest method of making hay, is one which demands our attention, for I do not think there is anything grown on a farm which for its value costs so much in point of labour, &c. I for one do not hold with the old-fashioned system of windrowing, grass-cocking, &c. My plan is to let the grass be mown some time—say three hours—in order that the ground between may get dry, for I think a great deal in making hay is to have the ground hot and dry. I then put the horse-machine, or hay-making machine, as it is called, across the rows; and when it has been over it once, begin again the reverse way of the field, or the same way it was mown, by this means you thoroughly shake it out. I then have the horse-rake, and rake it into as large rows as possible. I then have them turned over and shaken out by hand, and before evening again have them raked into rows by the horse-rake, and, if the weather is unsettled, have them put into large cocks. I think it a great advantage to keep your ground as well cleared up of a night as possible, as the heavy dews not only make the hay damper when lying all over the field, but likewise the ground cannot get dry so soon. I generally find that by twice shaking out with the machine, and byraking and turning as I have stated, the hay is made in at least half the time that it would take by the old method. Many people object to the frequent use of the horse machine; they say, "If you do the hay over more than once, you lose so much weight in the seeds." Granted, so you do; but at the same time you yearly sow your meadows with seeds, which you would otherwise have to buy (Hear, hear); and it is a question whether you lose so much in solid weight of hay as the expense of seeds would be. You cannot sow an acre of meadow ground with seeds under 10s.; well, then, reckoning hay at £4 per load, that is the value of 4½ trusses of hay, you will not make me believe that you lose in weight 162lbs. of hay per acre by those seeds: and again, look at the advantage to the hay by lying upon the ground; the sun has so much power upon it that it makes so much faster and better than any other way. It is, therefore, my opinion that where, by the old system, hay cost £1 in labour, it does not, by the plan I adopt, cost more than ten shillings; and surely this is a great saving, and particularly when your hay is in every respect equal in quality to the other. Now, gentlemen, in conclusion, let me invite your discussion upon this subject. There is a wide field open for you, and I trust this has not been uninteresting to you; if it has, it has been my fault, and not that of the subject. But I have tried to the best of my ability to be instructive; and this you may rely upon, that I have not propounded to you theories which have not been reduced to practice, but I have laid before you practical experience, aided by chemical investigation, and I trust I have not been wholly uninstructive to you. If by my remarks any one of you will be benefited, I shall feel myself amply rewarded for my trouble, and have the satisfaction of feeling that, however humble our abilities may be, yet, if we make the best use of them, we may be of some service to our fellow-men, and feel that we have not lived in vain (Hear, hear). As it has been remarked that he who makes two blades of grass to grow where only one grew before is a benefactor to mankind, I think I have shown to you that it is in the power of every one of you to be, not only benefactors to mankind, but also to your own selves (Hear).

Dr. SHORTHOUSE alluded to the extraordinary amount of unblushing imposition practised amongst professional and other classes in the present day; and in proof of this assertion instanced the case of an illiterate and half-educated man attempting, by giving specious and high-sounding titles to things of comparative insignificance, to set up an educational establishment, and, determined to carry it out on a scale of magnificence, immediately turns it into a "college," and calls his pupils "professors," and so lays claim to the support of the public from the "exalted" position of his academy. In this, as well as in many other things, there was a great amount of imposture exhibited; and, he might observe, that since he had paid attention to agriculture, there was no class of men more gulled by, or more open to the gullibility of, chimerical schemes than were the agriculturists (Hear, and a laugh). There were those who puffed their poisons down the bucolic throat with an amount of impudence wholly amazing. But to-night they had a very remarkable exception; and he was glad to hear Mr. Hunt bring forward his subject in such an unassuming manner, and at the same time displaying such a considerable amount of knowledge as to the physical structure and development of plants. It was quite refreshing to him (Dr. Shorthouse), and he was very delighted to learn that one who had thus got so excellent a knowledge of the theoretical had the opportunity of becoming also acquainted with the practical. Mr. Hunt thus possessed all the elements of success, and, as his land was within an easy distance of London, where an inexhaustible supply of manure was always procurable, he was in a very favourable position, and no doubt knew what it was to be a profitable farmer. With reference to the subject immediately before the meeting, Dr. Shorthouse first gave his opinion upon the use of gypsum as a manure, and stated that without question it was an excellent and highly appropriate manure for that class of plants generally, on account of the large portion of sulphur it contained. He then descanted upon the advantages that a farmer would enjoy whose land was situated within a short distance of London, so as to enable him to get a ready sale for his green meadow crops, which might be mown a second time. Dr. Shorthouse having touched upon one or two other points, without differing in any particular instance with the facts and opinions embodied in Mr. Hunt's paper, concluded by again eulogising that gentleman for the ability he had displayed in its production, and begged to tender him his hearty thanks.

The CHAIRMAN observed that the views embodied in Mr. Hunt's observations were such that he apprehended the members quite agreed with him, and he therefore did not anticipate that the question would cause much discussion.

Mr. Churcher said Mr. Hunt's paper was quite fit to go forth to the world as an essay, and as such ought to be published (Hear, hear). He had but little to say upon Mr. Hunt's remarks, for he had brought so fully before them all the bearings of the subject that little was left to be said. He (Mr. Churcher) quite agreed with him as to the manuring meadows with dung in the autumn—say until November; but to put it off later than that he thought was useless. He thought gypsum was a good manure for sainfoin, &c.; it seemed a very cheap manure, and used to be more used than at the present time. As to increasing the quantity of meadow land, he thought nine out of every ten farmers would be very glad to do so, providing they had some encouragement from their landlords. There was a loss in laying down meadow land; and he thought when a farmer left his farm he ought to be paid some remuneration for the meadow land he had so laid down. There wanted to be a better understanding upon the subject between landlords and tenants. Mr. Hunt had estimated the dung at 3s. per yard, but he thought it should be 5s. per yard; and they must remember that if it cost 5s. per yard, it also cost another 5s. per yard to bring it home (Hear, hear).

Mr. Powell was greatly obliged to Mr. Hunt for his elaborate and instructive paper, and thought he had clearly shown the necessity of reimbursing the land with those properties which they abstracted from it, and quite agreed with him as to the importance of returning those fertilizing properties to the soil which any crop might have taken from it, if they wished to keep the land in a good state of cultivation. He (Mr. Powell) considered the application of bone-dust and gypsum was always attended with beneficial results, as they were rich in those elements essential to the restoration of the soil (Hear); and it was a matter of great importance to have the greatest crop and the most lasting manure at the least possible expense. He warned the farmer against the suicidal principle of allowing the soil to become impoverished for want of manure; for if it once got starved—it was like ourselves or animals it took a long time to bring it into condition again (Hear, hear).

Mr. Wilson did not rise to offer any particular remarks upon the subject before the meeting, as his land was for the most part under the plough. He was at variance with Dr. Shorthouse on the point of mowing meadow land twice, and thought such a practice not likely to lead to any desirable results; and as to the green crops, which it had been said would be sold so rapidly in the London markets, he said it was never mown in a green state. He asked Mr. Hunt if bones applied to turnips and swedes left any goodness in the ground for the succeeding crop of corn, and did he recommend gypsum to be applied to trifolium and tares?

Mr. Hunt replied affirmatively to both these questions.

The Chairman made some remarks upon the points which had incidentally arisen in the discussion. He first endorsed the eulogiums which had been previously passed upon Mr. Hunt's paper, and he thought Mr. Hunt must have taken considerable pains in getting the subject up. It had not been done crudely, but he had fed them with convenient food well prepared for their weak digestion (laughter). He was of opinion that the consideration of the subject before them appeared much more important to him that evening than could have been conceived by simply passing over a number of broad acres without much reflection or discussion; and he considered this fact another illustration of the benefits accruing from such meetings as these, without which the subject could not have been brought to so practical a bearing (Hear, hear). With reference to the plan of Mr. Hunt for laying on the manure, he was much disposed to lean to his side, although there was great authority upon the other side of the question. Some of the best hay which came into the market was brought from Middlesex, a county which stands preeminent in that respect. The practice there was to manure the land at a part of the season when the rays of the sun had very great power, and so a large proportion of the most important constituents of the manure evaporated; he was therefore inclined to think that when they had the milder autumnal days was the best time for manuring. Referring to the subject of bone manure, his experience in Cheshire led him to the conclusion that its introduction and use were attended by enormous benefits (Hear, hear). Although they only reckoned on a benefit from their use for two or three years, he believed they might take a greater margin, and that they derived some benefit from them for five, six, or eight years. Mr. Churcher had remarked upon the subject of laying down meadow land. They appeared to be all agreed that it would be advantageous to extend or increase their meadow land, but the difficult point was, who would bear the expense, the tenant or the landlord? Mr. Churcher very properly suggested both. If the former laid it down, he would not reap the benefit he would deserve; and even if he held a comparatively long lease, the probability was that his returns would not be at all equal to his outlay. Those who turned their clay brown hills into green land ought to be well remunerated for their trouble, and he (the chairman) said that there certainly ought to be a covenant in every lease with landlords that the incoming tenant should take by valuation the meadow land laid down by his predecessor. Mr. Fuller said he thought there were very few landlords who were blind to these facts any more than they (the farmers) were blind, and that they merely required their eyes to be drawn to the focus; and he contended that in many cases it was not so much the fault of the landlord as the tenant, as they often did not know the wants of a tenant till they had been pointed out to them; he therefore hoped that when they (the tenants) took a new lease they would ask their landlords to take this matter into consideration, and he felt sure they would obtain what they required. After some additional observations, Mr. Fuller said the opinions of Mr. Hunt, as expressed in his paper, were so thoroughly in accordance with what he considered to be correct, that any other comments would only be tedious and unnecessary.

Mr. Hunt, in reply, urged the importance of keeping meadow land in good heart, and not making merely a convenience of it. He thought it important an understanding should be come to between landlord and tenant. As to laying down meadow land, he believed it might be seven or ten years before meadow land could be made to pay for the outlay. The first year was fallow, the second year was the sowing, and the third year they would not get much grass; but at the end of the fourth or fifth years, meadow began to grow in value. He believed there were as great restrictions against laying down arable land into meadow as there were to breaking up meadows for corn, &c. With respect to what Mr. Wilson had asked about the lasting properties of bones, he believed their good effect was visible for ten years. He believed it was the custom in Yorkshire to allow half-dressings for bones two years after they had been put on. He had found wherever he had used bones on meadows it had always produced white clover, although none had been visible before. In conclusion, he thanked the members for the kind manner in which they had received his remarks and listened to his paper, and felt very pleased that it had given such general satisfaction, and that his opinion was so much in accordance with theirs.

Mr. Wilson moved, and **Dr. Powell** seconded, a vote of thanks to Mr. Hunt; and a similar compliment having been conveyed to the chairman, the meeting broke up.

THE FOOD OF PLANTS, AND HOW THEY TAKE IT.

BY DR. JOHN A. WARDER.

A paper read before the Pomological and Horticultural Society of Southern Illinois, Dec. 1859.

Our investigations among animals disclose to us that some of them consume other animals for food, while others feed exclusively upon vegetable growth, and some, like man, are *omnivorous.* But a question of food remains to be investigated and answered; it is this: What is the food of plants? This I shall attempt to answer, though well aware that it is a question of no mean importance—indeed, it is the very foundation of all thorough understanding of scientific agriculture and horticulture. It involves an understanding of vegetable physiology—a science which has received much attention within the past century, but which, owing to human imperfections, has enunciated many false propositions; it has been obliged to consider, and to reconsider these, again and again; each time claiming to be right, and was so believed until proved to be otherwise. Even now, while we advocate our favourite views, the honest philosopher must admit that he is but in his A, B, C of the science. The doctrines upon this subject that have been enunciated by Liebig are remarkable for their perspicuity, and are the most satisfactory, though he too has his opponents, who are not willing to admit the truth of the *dicta* of the great German agricultural chemist.

Examining (as a preparatory step, before making answer), what plants are made of, we may find some guide in our investigation. Besides small quantities of certain inorganic substances, we discover certain compound bodies, which in chemical language are called proximate principles, such as cellulose, and vegetable jelly, sugar, gum, and starch, all of which are composed of similar elements, combined together in very nearly the same proportions; we also find various oily or fatty and waxy substances differing from the first in having less oxygen in their composition. Besides these we also find nitrogenous matters, that have a very important part to play in the chemical changes that the food of plants must undergo in its proceses for the formation of the proximate principles just named. The two important elements in the *food* of plants, therefore, are *carbon* and *nitrogen*; the other elements are found in water, which is composed of *oxygen* and *hydrogen.* These four elements, therefore, are of the greatest importance to plants, but of them the former, carbon and nitrogen, must claim our first and chief attention in this inquiry. It has been generally supposed that these substances were provided for plants chiefly by manures, and by the humus, or decaying vegetable matter of the soil.

The last result of the decomposition of animal and vegetable matters, after the escape of the gaseous compounds, is a dark substance called humus. It abounds in the prairie soil, in most rich soils, in manured soils;—further, humus is rich in carbonic acid, and ammonia; hence, when we speak of a soil being rich in humus, we mean that it is well furnished with these elements of plant food—in other words, a rich soil.

That ammonia and carbonic acid are the sources of nitrogen and carbon, for the supply of plants, there can be no doubt; and that these substances are produced in immense quantities on the globe, and diffused through the atmosphere, we are equally assured; but we find the results of respiration, and of combustion, the escape of carbonic acid and ammonia from the craters of the volcanoes, and all our fires, and smoke stacks, do not increase the quantity in the atmosphere appreciably, for there is but a small, uncertain quantity of ammonia, and a definite, small proportion of carbonic acid. These substances are drained out of the atmosphere, and have not increased in it. Geologists tell us that the immense quantities of the coal on the earth, must have been derived from a rank vegetation existing at a former period, when it is probable that our atmosphere was very highly charged with carbonic acid gas.

How do the grasses and weeds of these great prairies, and the trees of our wide and noble forests obtain their carbon, if not from the atmosphere? and yet we make no return of carbon for all that we take from them. Successive crops of charcoal have been burnt and removed from the mountain regions, where the trees can find little humus, and can return only to the soil their foliage to decay and make more; the cattle pasturing on the prairies must remove immense quantities of carbon in their tissues—the supply to the trees, grasses and weeds has been kept up from the atmosphere undoubtedly.

We are told that the northern provinces of Holland export a million pounds of nitrogen annually in their cheese—this must have been taken into the organisms of the cows, from the ground, through the grasses upon which they feed. Man makes no compensation for this. Whence can it come? undoubtedly from the atmosphere, which is the great medium through which it is silently conveyed from the great craters of volcanoes that pour out with their molten lavas invisible streams also of carbonate of ammonia.

Boussingault's experiments, which were conducted on a large scale, confirm these views—he had them continued on one spot during 21 years; he carefully weighed all the manure applied, and all the crops harvested, and the quantity of carbon, hydrogen, oxygen, nitrogen, and ashes, of both manure and crop, were carefully estimated in the whole of both, by means of chemical anaylsis. Now for the result: the annual harvest, on an average, gained twice as much nitrogen, three times as much carbon and hydrogen, and four times as much oxygen, as had been applied to the soil in manure.

Here we find the value and the beauty of the science of chemistry and its application to practice —this depends too upon what chemists call the law of proportions, which may be thus stated: Each element or different kind of simple matter will combine with others in certain definite proportions—thus, carbonic acid, a compound, is always composed of oxygen and carbon, in the proportions of 16 by weight of the former, united with 6 of the latter substance or element. Ammonia always contains 3 of hydrogen with 14 nitrogen; but, referring to the experiments of Boussingault, and believing that carbonic acid, ammonia, and water, are the food of plants, we find that they contain more oxygen than is needed for the plants—more than their tissues contain; hence we infer that oxygen must be set free—a fact long ago discovered by absolute experiment, and verified by every tyro in chemistry—and here we have another beautiful proof of the wisdom of the arrangement. This oxygen, necessary for animal life, as it is the great supporter of respiration, and equally necessary to combustion, is eliminated by plant life, and sent to renew and purify the atmosphere by the very plants that had first removed the noxious compounds from the air:

Carbonic acid	Oxygen	16	2
	Carbon	6	1
Water	Oxygen	8	1
	Hydrogen	1	1
Ammonia	Hydrogen	3	3
	Nitrogen	14	14

Here we find a grand exchange or interchange of elements of matter between the three great kingdoms of nature. "Decomposition and the process of respiration set free all vegetable and animal substances (diminishing the amount of oxygen in the air), in the form of carbonic acid, ammonia and water, which diffuse themselves in the atmosphere. The plant takes possession of these substances, and forms from them (accompanied by an incessant *increase* of the oxygen of the atmosphere) some compounds that are rich in carbon and hydrogen, but devoid of nitrogen, such as starch, gum, sugar, and the various fatty matters, and others that are rich in nitrogen, namely, albumen, fibrine, and casein. These compounds are for the service of the animal, which builds up its corporeal frame from the latter and burnt the former in the respiratory process, for maintenance of the necessary heat. This theory stands now, firm and unshakeable upon the facts which have been brought forward, and the naturalist is perfectly correct when he says, that man, through the mediation of plants, in the first instance, *lives upon air*. Or, we may express it in this way: the plant collects matters from the atmosphere, and compounds from them the food of man; but life itself is only a process of combustion, of which decomposition is the final conclusion. Through this combustion all the constituents return back into the air, and only a small quantity of ashes remains to the earth, from whence it came. But from these slow, *invisible* flames, rises a new-born Phœnix, the immortal soul, into regions where our science has no longer any value."*

Humus is however a most valuable element of soils, being carbon in a state of minute division; as carbon it is almost indestructible; as carbon it does not appear to be taken up by plants; its important rôle is to absorb water from the atmosphere, and to absorb and retain for the use of plants—to which it readily yields them—the carbonic acid and the ammonia from the air: in this power it appears to have no equal. Humus, therefore, always contains water and those gaseous matters which are the food of plants, and whenever it yields up a portion to growing vegetation, it absorbs fresh supplies from the atmosphere. This humus is therefore not the food of plants, as was formerly supposed, but it is the *food bearer*, the storehouse or *pantry*, holding the gaseous food of plants.

Other elements are needed by plants as food, however—mineral elements—that do not come from the atmosphere, but from the soil itself; hence we find a flora peculiar to certain regions, and some plants that are never found in other soils than those peculiarly adapted to them. So also with our manures; they must be selected in accordance with the peculiar wants of the crops to which they are to be applied, and with the particular composition of the soil upon which they are to be sown. This is the basis of agricultural chemistry, and by its aid, if properly conducted, we learn not only the elements contained by any given soil, but those substances that appear to be the necessary constituents of any particular crop—and thus we may be guided in the application of manures to any soil, and for any crop, with some degree of certainty, instead of blindly and empirically applying this or that kind of manure, which we may have heard or read was a successful application to the crop in question. What proved successful on one soil might be quite useless on another, where a different element of plant food is deficient. This will explain the very contradictory accounts which we receive from sources equally reliable in our agricultural publications, and in the experience of farmers.

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* Schleiden—The Plant, p. 152.

We sometimes find that the richest soils, as we call them, rich in humus or vegetable mould, will produce enormous crops of one kind of plant, but fail to produce an adequate return, if sown with other crops. This has been satisfactorily explained by Liebig, to whom we are indebted for much of our knowledge on true agricultural chemistry at the present day, for the clearest views and the safest, because the soundest postulates. He tells us that wheat does not flourish on soils that are rich in pure vegetable mould, because this plant needs *silex* as an element necessary to its healthy constitution, and without which indeed it cannot exist. This substance it does not find in vegetable mould. Liebig discovered this by burning plants; in this process the organic elements were dissipated by forming gaseous compounds that escaped, while a certain portion remained fixed, as ashes—composed of lime, silex, soda and potash, salt, bone-earth, gypsum, &c.—substances which could not be volatilized. His investigations further proved, that any given plant generally yields nearly the same proportion of ash, composed of almost exactly the same substances, and also that different plants furnished ashes for very different composition.

Theo. de Saussure, in his "*Researches on Vegetation*" was the first to point out the constant occurrence of determinate mineral constituents in determinate plants—(Schleiden).

Upon which Liebig takes this position: "Since the organic nutriment stands everywhere in equal abundance at the service of all plants, the cause of the great difference of vegetation cannot be sought therein, consequently it must lie in the inorganic constituents, and it is essentially indifferent whether we convey manure to the field, or burn it first and strew the ashes on the soil, since its efficacy is dependent solely on the constitution of the ashes:" a position which is rather startling in its first enunciation, but one which is founded in fact and which is incontrovertible, if we admit that manure is plant-food, though the mechanical effect of some kinds of manure would not be had by their ashes alone.

Now it is a fair inference that all of these several substances are intentionally introduced into the plants for some wise purpose, not merely for man's use, but for the well-being of the plants themselves, to which, indeed, they are necessary parts, and that if a plant cannot procure all of the various substances needed for its perfect devlopment, it must fail to produce its highest result, as we invariably find to be the case.

The farmers about Philadelphia, Pa., (many years ago) thought they were doing the very best practice, when they purchased, and brought back to their farms a large load of manure, for every load of produce which they sold and took away from the soil; they also thought it was best to feed as many animals as they could supply on the farm, for the sake of making as much barn-yard manure as possible. In this they were right: they had a just appreciation of that most valuable material, but in their application of this manure they did not act so wisely as they might now do—they were guided by a limited and erring *experience*, not by *science*. The wheat crop was looked upon as the source of revenue in consequence of the nature of their lands; and a long continued course of bad farming robbing the soil of some of its necessary elements, this crop had been reduced to the minimum amount of profitable culture, often below this; hence the very natural conclusion of these improving agriculturists was to manure their wheat crops. They were delighted with the results; the yield went on steadily increasing to a certain point; but they found at the same time that the amount of grain was increased, they were having a larger growth of straw, which did not stand up well, and they were subjected to losses from many diseases not before incident to the crop, and thus their hopes were often blasted. Somebody suggested that as he had observed this effect did not occur in a place where lime abounded in the soil, this substance might exert a beneficial influence. It was used with the happiest results, but they continued the bad practice of applying manure to the wheat crop—bad for two reasons.

1st.—The wheat was sold off the farm and did not yield any return, as would have been the case with other crops, and from this observation was deduced the axiom and practice of a few *best farmers:* never apply yard manure to *man crops*, but always to the *cattle crops*; the latter, being increased in amount, enable the farmer to feed more largely, and thus to produce more of the fertilizing material for the renovation of the soil.

2nd.—It was bad policy to apply manure to the wheat crop, because the best portions of the mass were generally dissipated into the air, lost to the owner, by means of the fermentation that occurred in the manure heaps that were piled up to wait all through the summer, until the proper season of applying to the wheat in the autumn. From observations of the loss that thus ensued, and in consideration of the axiom above referred to, a few of the most intelligent farmers learned to apply their manure exclusively to the *cattle* crops, and to apply it fresh from the yards, in a partially decomposed state, instead of waiting until much of the most valuable portions had escaped. Those also who looked further, and observed the absorbing power of certain substances, and who also learned that this volatile ammonia which was wasted from the manure could be chemically *fixed* or rendered non-volatile, still continued to heap their manures, but at the same time to *compost* them with suitable materials, loam, sods, road scrapings, swamp muck, &c., &c., and to apply gypsum to the mass, whenever they could detect ammonia escaping from it. Many also went so far as to erect sheds to protect the pile from the action of the weather, and to use pumps, by which the watery parts should be repeatedly thrown back upon the pile, to encourage the decomposition of the woody fibre it contained. For many crops the manure is thus brought into a much better condition, and by the fermentation a large proportion of the seeds of weeds would lose their vitality. Such a compost, half loam or peat, is thought better, load for load, than fresh yard manure.

To recur to the main question, let me again refer to the great German philosopher, who has divided cultivated vegetables into four clasees, according as one or other of the important inorganic elements predominates in their ashes.

1st.—*Alkali Plants*—Those who contain double alkaline salts, such as beets and potatoes—the vine.

2nd.—*Lime Plants*—Those that contain the earths, especially lime and magnesia, as clover, peas, beans, &c.

3rd.—*Silex Plants*—Those that contain silex, as the grasses.

4th.—*Phosphorous Plants*—Those that contain the phosphates, such as wheat, corn, rye, oats, &c., the cereals—fruits.

With these lights before us, and with the full understanding and adoption of the proposition that *all manure* is but *food of plants*, and that the *stimuli* of vegetation are heat, light, and perhaps electricity, with which latter upon the present occasion we need have nothing to do, we may hope to indicate a practice in the supply of plant food or manure, that will be productive of good results, and, as a summing up, the following propositions may be announced :

1st—Ascertain the chemical character of the whole of the plant to be fed or manured—the crop to be grown.

2nd—Ascertain whether the soil upon which we intend to sow the seed contains a sufficiency of all the inorganic elements needed by the crop.

3rd—If there be any deficiency of any one of these elements, let it be supplied at once with the needful material, in a condition to be accessible and available to the plant, but we must avoid excess.

4th—Ascertain whether there be any acrid or poisonous substances in the soil, that would prove injurious to the plant; even an excess of some of those elements that are needful constituents of the vegetation that is desired, will, in some cases, prove fatal to success—this is especially true of the alkalies and alkaline earths in a caustic state; but the latter, lime, is soon neutralized by exposure to the air. It is also true of sulphate of iron, also corrected by lime.

5th—In the application of manures of any kind, whether yard manure, more concentrated compounds of excrementitious and other animal matters, or those substances that are called *special and mineral* manures, care must be exercised to have these matters properly comminuted, and for this purpose they may be mingled and diluted with common soil—thus they may be the more evenly and regularly distributed. This is especially the case with guano, boiled or ground bones—oil cake, poudrette, &c.

6th—In the use of yard manures, the great question, as to whether it shall be applied green, or thoroughly fermented and composted, the answer must depend upon the character of the soil, as to its texture, and also upon the nature of the crop to which it is to be applied.

7th—For corn, potatoes, and other field crops, apply it green, and in the spring of the year, particularly on clayey soils. For gooseberries, currants, shrubbery, &c., where it may be useful also as a mulch, apply it on the top of the freshly dressed soil, either in the fall or early spring, but the former is better. For grass lands, apply late in the autumn or early in the spring—without regard to the moon's phase. For gardens, vineyards, and in all cases where it is an important desideratum to avoid weeds, and where the soil does not need the disintegrating influence of decaying vegetable fibre, let it be very thoroughly composted, but let this process and the fermentation attendant upon it be very closely watched and kept under control; such manure can be thoroughly incorporated with the soil and be accessible to the roots.

In support of the recommendation to apply the manure unfermented or fresh, I may again refer to the great loss of ammonia that is sustained by fermentation, and also let me assure the timid one that he need not be afraid of losing his manure spread upon the surface, if the soil have been prepared for its reception. Of all the wonderful things on the face of the earth, what is more surprisingly wonderful than the soil itself? * * When we find that its chief ingredients possess the power of retaining just the very elements that are designed for the food of plants, which it will then hold firmly, not allowing them to be leached out by water, but ever ready for the roots of plants, we have reason to admire the wisdom that has so planned and ordered it.

Baron Liebig, in his recent work on modern agriculture, says: "There is not to be found in chemistry a more wonderful phenomenon, or one which more confounds all human wisdom, than is presented by the soil of a garden or field.

"By the simplest experiment any one may satisfy himself that rain water, filtered through a garden or field, does not dissolve out a trace of potash, silicic acid, ammonia, or phosphoric acid. The soil does not give up to the water one particle of the food of plants which it contains. The most continuous rain cannot remove from the field, except mechanically, any of the essential constituents of its fertility. The soil not only retains firmly all the food of plants, which is actually in it, but its power to preserve all that may be useful to them extends much further. If rain or other water, holding in solution ammonia, potash, phosphoric, and silicic acids, be brought in contact with the soil, these substances disappear almost immediately from the solution ; the soil draws them from the water. Only such substances are completely withdrawn by the soil as are indispensable articles of food for plants; all others remain wholly or in part in solution. If a funnel be filled with soil, and a dilute solution of silicate of potash be poured upon it, there will not be found in the filtered water a trace of potash, and, only under certain circumstances, silicic acid. If freshly precipitated phosphate of lime or phosphate of magnesia be dissolved in water saturated with carbonic acid, and filtered in like manner through soil, there will not be found a trace of phosphoric acid in the filtered water. A solution of phosphate of lime in dilute sulphuric acid, or of phosphate of magnesia and ammonia in carbonic acid water, composts itself in the same manner. The phosphoric acid in each case remains in the soil. Charcoal reacts in a similar manner with many soluble salts; in this case, it is a chemical attraction acting from its surface, but in the soil its constituents take part in the action." This remarkable property is not found to exist when solutions of substances are used which do not furnish food to plants; it is in their case especially that this wonderful property exists in the soil.

The value of these interesting facts is immense. As a purifying agent there is nothing better nor so cheap as clay, which possesses this power in a high degree. In the collection of liquid manure in tanks, the decomposition and escape of ammoniacal vapours may be wholly arrested by using clay as an absorbent; and until the soil becomes saturated with these substances, the liquid that passes through is found to be devoid of smell; all the rich plant-food has been left in the compost. When one change of soil has become saturated, another should be introduced.

Liquid manures, especially when largely diluted with water, are found to be highly serviceable; certain elements of the food of plants are thus carried to the soil; other matters equally needed by vegetable organizations are not soluble, and cannot be thus conveyed. The impression which has prevailed, that all plant food must be reduced to a liquid form to enter the little root-mouths (*spongioles*) is perhaps erroneous. Water is needed as food, and is absorbed as water; other substances, soluble in this menstruum, are conveyed into the organism with it; but Liebig contends that the roots have the power of taking in these matters without their previous solution. He says that "We have supposed the food was carried in solution in rain water and carbonic acid to the roots of plants, which were thus like sponges, half in the moist ground, half in the air, continuously absorbing by their roots and evaporating by their leaves. Whatever was in solution passed with the water into the roots, and by the process of nutrition was appropriated by the plants. The soil and the plant both being passive, * * * we believed that the water was the carrier of the most remote elements of the soil to the immediate presence of the plant. * * * But all this has been a great mistake."

Examinations of rain water that has passed through the soil and collected by drainage, of spring water, and of river water, show that they do not take up those substances that are known as plant-food in any considerable quantity.—"These substances are present in the soil, in a condition fit for absorption by the rootlets of plants, though not themselves soluble or removable by the rain water, until the soil is saturated with them. It is more than probable that the majority of our cultivated plants receive their nourishment directly from those portions of the soil which are in immediate contact with their rootlets, and that they die when their food is presented to them in solution. The action of *concentrated* manures, burning the young plants, seems to support this supposition."

* * * It follows that the plants must themselves play some peculiar part in the absorption of their food. As organized living structures, their existence is not quite dependent on external causes. * * * They select from the soil those substances which they require, but which can only pass into their interior by the co-operation of a cause which resides within their rootlets. * * It is very difficult to explain in what way plants act in causing the solution of mineral substances. As a matter of course, water is indispensable in the operation."

Green manures have been highly extolled, and not without cause. Though they can add nothing to the mineral wealth of the soil, they add carbonaceous and nitrogenous matters, having collected the elements from the atmosphere; further, they bring up mineral matters from the subsoil, which they penetrate with their long roots, and in their decay they enrich the upper soil for the use of cereals and such other plants as chiefly occupy this portion as their range in search of food. It will be readily guessed that annual plants need to have their food more accessible than perennials —such as trees, which have a wide and deep range.

Before concluding this paper, I ask to thank one of the members for his kind assistance in preparing this report. Mr. D. B. Pierson is, as you all know, deeply interested in whatever concerns the advance of horticulture. He is a good observer, and has proved himself a good practitioner in the art of preparing the soil, so that it shall produce good crops. From a communication, addressed to the Chair, your committee have condensed the following practical recommendations:

"Guano, when properly pulverized and evenly scattered over grass lands or well cultivated grounds just before the fall rains, produces a marked effect upon the crops of the following season. The residuum from glue factories, and that from the rendering establishments (bones) have highly fertilizing properties, and may be applied upon ploughed or trenched ground in the fall, or composted with an equal bulk of stable manure, or sod, or loam, to be applied at convenience. These substances should be applied with caution."

He also highly recommends the manure pit, into which all refuse matters should be thrown, with alternating layers of sods or loam, leaves, leaf-mould, stable manure, &c., and the whole to be moistened by a pipe from the kitchen sink to bring all waste water from that department—(the drain from the water-closet should also terminate here). He thinks this application of liquid would prevent fermentation, and that if the mass did ferment, the water would absorb the ammonia and thus be improved as liquid manure.

For the indication as to the best season for applying manure, Mr. P. cites Dame Nature, who makes her applications in the autumn, and thus keeps up a constant fertility—whereas, the fields that come under man's culture generally grow poorer, the longer he has the charge of them.

After some remarks upon vegetable physiology, he reiterates: "For spring crops I should apply manure, whether fermented or not, upon the surface of the ploughed ground, about the 1st of November, or before the setting in of the fall rains; and in the spring, plough the residuum under, and mix thoroughly with the harrow." For fall crops, he would make the application before the final ploughing, and thoroughly mix with the harrow, and then cover the seed with the drill or harrow, never with the plough. Evaporation never hurts manures or composts thus applied, the watery particles only escape. Thoroughly prepared composts may be applied at any time, when the earth is in a condition to receive it; but he prefers to manure his trees, shrubs, and plants in the autumn, when he thinks that the earth is preparing to digest the food to be used by the crops the next season, though they may be active to a certain extent even now.

FARMING WITHOUT THE PLOUGH.

When Mr. Smith of Woolston first propounded his system of culture, practical people admired the construction and performances of his powerful grubber and effective subsoiler, but shook their heads doubtingly at his repudiation of the turn-over plough. However, his successful husbandry during a course of years, witnessed by thousands of intelligent farmers from all parts of the kingdom, and the equally striking examples of tillage by the steam scarifier now to be found in almost every county in England, have done more towards condemning our long-venerated implement, the dear old plough, than all the treatises and "Talpa" teachings which have striven to convince the stubborn agricultural world. Thanks to the cheap and efficient grubbers, scufflers, drags, *et hoc genus omne,* now so prevalent, everybody is finding out that while the share, coulter, and mouldboard of a plough form a capital mechanical apparatus for cutting the soil into sections and uplifting the lower soil into daylight by burying the upper surface, the same knife-edges and screw-wedge make by no means the best tools for tilling, pulverizing, and cleaning the sections or furrow-slices when so upturned. But beyond this, the Woolston system and steam-culture generally are showing us that this inversion by the plough, or indeed by any other means, is necessary far less often in the course of a rotation of cropping than has been commonly supposed. We can get a good seed-bed for some crops without ploughing at all; and the tine of the cultivator forms the most effective tilling instrument, and is worked with the least expenditure of mechanical power in proportion to the fineness of division obtained in the soil. But we are not to banish the plough altogether. Loudly as Mr. Smith may denounce "the turnover plough," it is still the mainstay of all his husbandry; for the ridges on which his root and bean crops are grown are thrown up by a plough; the exposure of the subsoil in the bottom of his deep trenches is obtained by means of a plough; and with his stirring and smashing-up implement only, and without the plough, he could not get the deep pulverulent seedbed that he now obtains. The ordinary plough is used at Woolston only for turning over clover leys—which, done with a skim-coultered first-class wheel plough, is, for the preparation of this particular crop for wheat, a superior process to any that Mr. Smith can devise. But for trenching-up the ridges, it is, of course, a double-mouldboard plough that is used; and, call it by what name you please, as it has both share and mouldboard, with which it turns over the soil, turned both sides, it is a plough all the same. On some lands and for various crops, there may be no method of deep trenching or bringing up the subsoil so effectual as this one of casting into yard-wide angular ridges; but other soils will be better trenched by the Cotgreave plough, cutting two furrows deep, and packing one slice upon the other. And digging-machines may perhaps yet surpass either description of implement in value.

Leaving this subject, we propose to inquire into some early instances of a "substitute for the plough," in the preparation of ground for a seed-bed, and, in the course of our papers, hope to meet with some little enlightenment and a few novel views on the subject of cultivation.

In the year 1784 Arthur Young made one of his famous "Tours," to refresh his recollection respecting "the bean-husbandry of Kent," and to view the agriculture of Foulness Island, which was at that time exciting some attention, from its abolition of fallow, and its dependence upon the bean crop. In this island of rich salt-marsh, he says, "when the bean-stubbles are foul, *they are hand-hoed, in order for drawing the weeds together with a drag-rake before they plough,* which they do once or three or four times, according to circumstances. I cannot but remark upon this singular practice, that it is the greatest panegyric in the world upon the cultivation of the Isle of Thanet, where they have found the necessity of the practice so great as to occasion the invention of a machine purposely to do this work. It is a great skim, which cuts the surface in such a manner that the weeds are easily collected by harrowing, which is a cheaper and much more effectual method than by the hand-hoeing work of the Isle of Foulness. Both islands have, from a very extensive experience, found the necessity of cleaning their bean and pea-stubbles before they plough. When a crop is going to be put in, nothing can be worse than to plough in weeds. *All root-weeds are by that means rather planted than destroyed;* and others choke the plough, occasion a bad tilth, and very unsightly work. To clear, therefore, the field entirely, before the ploughs go into it, is a most admirable system of management. I have used one of these large skims many years upon my own farm, and know not any tool more truly useful and effective."

Near Feversham he found the beans put in with a drill-plough, in rows 20 inches apart: "They keep them in a garden degree of cleanness by horse and hand-hoeing, the latter generally twice or thrice, and two, three, or four horse-hoeings. They use a skim, which they call a horse-break, for cutting the weeds, and loosing the surface of the intervals; earth them up twice, first with a moveable iron fixed to the break, and afterwards with a double mouldboard plough, made on purpose, with a very long, round share, finishing in a narrow point. They work the last tool with a horse among the beans, even when they are in full blossom, and find that they receive no damage from it. After harvest, they cut the stubble with a skim 2 feet wide, which answers the purpose of the great Isle of Thanet skim for preparing the land for ploughing. They esteem beans the best preparation in the world that wheat can receive.'..... I was assured that the practice of sowing beans in rows was in use here above 100 years ago, and it was brought from East Kent at that time.... From Canterbury to Howletts I saw, all over the country, horses drawing skims through the crops, that reached to their sides. After cutting, and sometimes before carrying, they plough the stubbles, with a very broad-shared plough without a mouldboard, across, in order to cut the weeds remaining, to harrow fine before ploughing for wheat. This is the second contrivance I have met with for this purpose; and in Thanet they have a third." Young urges the value of the hoed bean crop instead of a bare fallow; the latter, he says, in Foulness, are "ploughed very often, even to *ten* times, therefore do not give the weeds time to grow enough to kill them."

As early as the year 1768, a Mr. Fiske, of Shimpling, near Bury, introduced beans in place of fallow on a wet loam, sowing 16 acres, with "2 rows upon a three-feet ridge, upon an oat stubble, ploughed at Michaelmas, and mucked before the setting." Arthur Young observes upon this: "The culture of dry land by means of turnips is well understood, but the management of wet soils is yet (1785) in its infancy, except in certain corners of the kingdom little known, and in the farms of enlightened individuals. I hazard nothing in asserting that the great desideratum of Kentish agriculture is the discovery of fallow crops for clays and wet loams, by means of which summer fallows may be as completely banished from these soils as they are from sands. Mr. Fiske's practice, now the common management of his farm, is a very satisfactory and important step towards the introduction of this system."

In the "Annals of Agriculture" for 1788, a Mr. Mure describes his drill-plough, which brings us still nearer to the Woolston husbandry than the above autumn tillage of stubbles. The implement is either fitted as a horse-hoe or as a double-mouldboard plough, with two coulters standing up from the share like a V, in order to hoe the sloping sides of ridges; it has also a wheel falling in the furrow, with a revolving seed-barrel attached, for drilling the ridges as they are made; and a marker for scratching a small furrow for the seed along the top of the ridge. He explains what gave birth to the plough in question: "The frequent disappointments I have met with by the failure of a crop of turnips, even after some months of apparent health and vigour, made me more attentive to the present mode of culture; I soon saw that the great length of tap-root that plant has bears no proportion to the depth of cultivated soil prepared for its reception, and therefore that the plant must greatly depend on the substratum for its nourishment: if a moist season and a loose soil, its roots will penetrate it, and from thence procure sufficient sustenance; but if the reverse, after its having lived luxuriously and in high health, the roots having got through the cultivated soil will from necessity be obliged to crawl about for food on the hard surface of the substratum, where nothing but starvation and all her train of ills is to be expected. I had lately a turnip root measuring 27 inches long...... My first object, therefore, in the formation of this plough, was to give a much greater depth of cultivated soil to the roots of the plant; this it not only does, but at less expense; for having drawn one furrow the whole length of the field, *after it had been prepared and the dung spread as usual, every subsequent turn will form a ridge, gather the dung and bury it in the middle of that ridge;* it will make a drill, sow the seed in it, and afterwards cover it, making every ridge of the same height and exactly similar. And the plants having been set out at proper distances by drawing the common hoe across the drill, the plough will, with a man and any old horse, hoe four acres per day, paring the sides and bottom of the furrow, mix the soil and lay it up as before, and no weed to be seen." He adds: "Began this morning with three of my own drill ploughs, to sow *barley*, 2 bushels per acre." It appears also that several agriculturists at once adopted this ridge-and-trench culture, with this admirable implement.

We shall see, in future papers, still further proof of there being "nothing new under the sun."

THE PRESENT SPRING—THE YOUNG WHEATS.

The last harvest has undoubtedly proved a bad one for the good farmer, or for those who farmed rich or fertile soils. The produce was far too abundant, and for once, the better the farmer, the worse his fate. It is generally the fact that a large crop of straw fails to produce a profitable crop of grain: this was the case last year to an unusual extent. All the best soils proved very defective, in weight of grain more especially; but they were also deficient in quantity and quality to a remarkable degree, particularly in the wheat crop. This crop, under good culture and on good soils, was a signal failure. The barley crop was also a very irregular and unsatisfactory one, and the early rains in harvest did immense damage in sprouting it, so that "the wheat-grower" and "the barley-grower" know full well how to sympathise with each other from similar unfortunate causes.

The winter was fine. The spring and summer were luxuriant and productive; every department of spring culture as applied to these crops was carried out to perfection, and up to the month of July even a more promising appearance never presented itself to the anxious and expectant cultivators. With what gloomy forebodings did they view their prostrate crops, fallen from sheer inability to stand, owing to their enormous bulk! added to this, the torrid heat of several days in the month of July completed their dismay, by producing a simultaneous and premature ripening. This, again, threw them into further difficulties, in having such an accumulated amount of work to do, that the customary number of labourers could by no means accomplish it; hence prices rose considerably, their perplexities were daily augmenting, and great losses resulted. It was only the goodness of God, in granting such propitious weather for the ingathering of the latter harvest, that prevented numbers of our highly-prized cultivators giving way to despair.

My object in writing this paper is to aid, if possible, in palliating, if not in preventing, a recurrence (so far as the cultivator is concerned), of this distressing state of things. The winter has, upon the whole, been a fine one, and a full average plant of wheat has been secured thus far. It is upon the spring management of this crop of "young wheats" that I now desire to make a few homely remarks.

It seldom occurs that throughout the length and breadth of the land one universal complaint is made respecting the character of the wheat crop; but this year it appears that the crop—the wheat plant—is more or less lifted, the land being too light and dry on the surface to give sufficient solidity to the root-bed, hence much care and attention should be given to insure a truly firm root-bed, without unduly compressing the immediate subsoil, into which the plants have to penetrate hereafter in search of food. Rolling is the chief, if not the dernier, resort. This should be done judiciously. In this peculiar season the surface soil is light and puffy, the immediate subsoil tough and waxy. A heavy roller or clodcrusher would most likely consolidate this top subsoil too much, and, at the same time, convert the surface into a thick coat of dust. This would act very injuriously—first, in abstracting the source of nutriment from the present impoverished plants; and next, in so solidifying the subsoil that the roots fail to extract benefit from it; and in case of drought it becomes so hard that the crop itself, on thin clays, will droop and die; and on others turn deadly pale or light yellow, resulting in a most unproductive yield. The better practice appears to be this: First, use a light roller for the purpose of temporarily fastening the plants in the light soil; then, after a period (of which the farmer is the best judge, as to the state of the soil and plant) use a heavy roller, sufficiently so to compress the soil thoroughly, but still leaving plenty of fissures and crevices into which the fibres or rootlets may readily creep for sustenance. For this purpose this immediate subsoil should be nearly dry before this heavy rolling takes place; otherwise it would become like the kneaded dry brick earth, and consequently of no available use to the growing crop.

The treading of sheep is another of these resources for improving a sickly wheat plant. This must also be judiciously done. The soil ought to be dug on the surface, and by no means "siddy" underneath; otherwise the sheep will do hurt, and precisely from the same undue compression just named. The plant is so backward this season that it would be more than a doubtful policy to take this course this year; to say nothing of the best time for eating it off having passed by. When this course is adopted, it should be done and finished in a day or two; so that all is fed off at once. The plant on any medium soil will then tiller. Shortly afterwards a light harrowing might take place, and when ready a careful hoeing would complete the management of the *sickly wheat plant* on this plan.

The hoeing of wheat is now the universal practice, and it is generally followed by the most satisfactory results. Not so last year. Wheat hoeing was one of the causes by which such a superabundance was obtained—the soil and season combining to enhance the luxuriant growth. Hoeing on firm soils is eminently conducive to promote progress; on light or puffy soils it opens and exposes it too much to "weathering" influences. The firm soil requires opening, stirring and exposing: the light soil would probably be advantaged by stirring, but it must not be exposed to drying winds and sunny heats. The great question to be solved this year is their profitable management in their present questionable state.

All loamy soils in the present season are dry and puffy on the surface, and siddy, tough, and waxy beneath. What is to be done with these? Hoeing is objectionable—the less exposure the better; rolling is a doubtful benefit. The surface is turned into powder, the under-soil into brick earth. The farmer's judgment must be ever on the alert, and he must watch his time. If the weather and the season be propitious, he may probably benefit by both rolling and hoeing; at all events he must wait, and by no means think of letting business take its usual course, *i. e.*, *roll away*, and as soon as it is up again to *hoe away* as fast and as deeply as he can. No! no! this will not do. It is the season that rules the farmer; and if he acts in defiance of it, he will rue his own conduct ultimately. So far as it can be ascertained at present, it will be wrong to hoe at all. There is scarcely a crop on a surface soil on loams that would not be injured by much stirring. The best course is to weed freely with the hoe; and where desirable to use the hoe in hoeing, do so, but do it cautiously and with judgment.

On light soils, hoeing must do harm, unless some pouring rains descend, to be followed by continuous drought. Then to loosen the surface may do good; but great care is requisite. The danger this year is not in the prospect of a heavy and unproductive crop of straw, but in a light and frothy crop altogether. The plant is thin, and farmers cannot resort to their usual mode of increasing the plant by promoting the tillering process, or aid the growth by hoe-cultivation. At present it must be let alone. Get forward all other work; and if the season should prove to be propitious, then all hands to the work, and let judgment guide. It is, after all, a kind of gambling with the crop, to make it undergo certain expensive processes without a knowledge of its state and prospects; both these must be well considered before any expensive course of management is adopted to improve it.

REPEAL OF THE MALT-TAX.

Ever since the recognition by the Legislature of the principles of unrestricted competition the continuance of the malt-tax has been an injustice and a contradiction. From the very date of Free-trade the repeal of the malt-duty has had an "opportunity." But it never commanded so good a one as just at present. It would almost seem, indeed, as if the Chancellor of the Exchequer were amusing himself by ascertaining how much his good friend "Mr. Farmer" really will submit to. Almost every other class finds occasional relief in some shape or other. So far, however, from the burdens of agriculture being a difficulty, or the yet incomplete features of a great scheme, they are coolly made to tell heavier than ever. Not only shall the produce of the British soil still be encumbered, but even ingenuity shall be tasked to play off something more against it. And our rulers know well enough what a safe card such a one as this is to put down. Let the rurals grumble a little if they like, they have got a character for doing so; while we may coolly instance Mr. Mechi, or some other as convenient an authority, who is making his four or five hundreds or four or five thousands a-year—it does not much matter which we say—to show what a capital business it is, after all! And how little cause they have to complain! Besides—and this is a very important consideration—the farmers are a class of people without *power*. They have actually no proper representation; and so when the Prime Minister, or the Chancellor, or the President, says in an off-hand way at once, "there is no possibility of doing without the malt-duty," the country gentlemen will complacently shake their heads, and echo that they are "afraid there is not."

This is the weak place we have to look to. It will be seen from a report in another part of to-day's paper that the question is reviving. It would have been curious, indeed, if it had slept on, with the blessings of the new budget hanging over it. The Biddells, the Barthropps, the Bonds, and the Hawards have ably answered to our call, and held a meeting at Ipswich. The initiative has been taken, and subscriptions are to be collected, petitions signed, and other means for a general agitation of the subject determined on. Sir Fitzroy Kelly, too, one of the county members, has been conferred with, and is to bring forward a motion on the subject in the House immediately after the recess. This is the point to fight at. Meetings, and subscriptions, and petitions, and unanimous resolutions declaring that the Malt Tax is unjust and oppressive and so on, are all very well, and no doubt all very necessary. But there must be some end to them. And this is precisely what was not the case with the Anti-Malt-tax Association that went so energetically to work some thirteen years since. There was no end, no head, no mouthpiece, where, above all other places, it was wanting. Meetings were called throughout the kingdom, liberal sums in support were contributed, and telling tracts and papers published. The farmers talked it over with each other strongly enough, but they did not talk it over so strongly with their "Friends." And so the Anti-Malt-tax Committee could generally count upon the support of old Mr. Fuller, Mr. Frewen, another member for Sussex, Mr. Bond Cabbell, and occasionally perhaps on one or two more; but they seldom got beyond this. Now, it is very palpable, that the new Society must take a very different line of action. The country, the people, the farmers themselves are already tolerably well alive to the question. What we require now is, according to the old nursery story, the *fire*—to burn the stick, to beat the dog, to bite the pig, and help us over the style. It must be the business of the Anti-Malt-tax Association to light up this fire. Let us say the Biddells and Bonds will look up their own Members, as in fact they have done already. So far, so good; but in an adjoining county they have a very great authority on the subject—a gentleman who writes able letters, and gives good evidence as to the evil. Of course we refer to Mr. Hudson, of Castleacre. Let him be advised at once to see the Members for Norfolk. Then on another side is another near neighbour, always ready to take his share of the work, whatever it may be, that promises well for agriculture. Let Mr. Fisher Hobbs be asked to ascertain what the Du Canes and the Watlingtons mean to do—eloquent gentlemen either of them, that have a laudable ambition to be heard in the Commons Parliament. Here is the opportunity. Mr. Ball, of course, will rise spontaneously to the call in Cambridgeshire, while such men as Mr. Sam. Jonas and Mr. William Bennett should take care that he is well backed. Some friend may be easily had to take counsel with Mr. Disraeli. Mr. Steed, of Baldock, would see Sir Bulwer Lytton in Hertfordshire, where the Malt-tax repealers are once more at work. Mr. Smith, of Rye, Mr. Hilder, or Mr. Selmes, might be counted upon to do as much in Sussex. In a word, the tables must be turned. We must canvass our Members for once, and solicit with all due earnestness "the favour of your vote and interest."

It will be by no means necessary to draw the line too fine between those who are and those who are not representatives of the agricultural interest. The malt-tax, fairly put, is every Englishman's question, and "a hand" might be had where least expected. Still, the first need is to *whip up our own people*. Let this be the watchword, the very motto on the Ensign under which the new Society is launched. County Members have become rather too ready to admit that little or nothing can be done in the way of legislation for agriculture. Suppose, just for once, they try the experiment—not next year, or next session, or any other next time, but *next week*, or whenever Sir Fitzroy Kelly's motion comes on. It is curious, however, to see how cautiously honourable gentlemen are prone to avoid *volunteering* for any such a duty. Within these few days there have been large and "influential" Conservative meetings held on either side of Suffolk; one at Yarmouth, in Norfolk, and another at Maldon, in Essex. At these gatherings, much cheered M.P.'s talked whole columns of the local journals through. They attacked Mr. Gladstone and his Budget; they ridiculed Lord John and his Reform Bill; they discussed the wine duties, tea, and sugar; and other poor man's friends; but scarcely one word did they give to the malt-tax. At Yarmouth, we believe, it was never even mentioned; but let us do full justice to Maldon. Mr. Du Cane, referring to the men of Manchester, did say, in passing, "They will look at their agricultural neighbour battling with the malt-tax which raises the price of his staple beverage, and cripples the growth of one of his staple productions, and they will drink success to his exertions in copious libations of cheap claret." And his colleague, Mr. Watlington, followed him up in this wise: "I call it a dangerous Budget, because, while it admits the cheap wines and cheap luxuries of France, it makes up the deficit thus caused by keeping up war duties upon tea and sugar, and altogether ignores the existence of a most oppressive and unjust tax upon malt and hops. I call it a dangerous Budget, because of the method in which it deals with the malt credits—anticipating the income of 1861 in order to spend it in 1860; and, therefore, aggravating, to a greater degree, the difficulties which will, no doubt, meet the future Chancellor of the Exchequer." Let Mr. Du Cane and Mr. Perry Watlington be at once communicated with and encouraged. And let those other honourable gentlemen also be addressed, who can make fine flowery orations at Conservative festivals, but cannot find one word to offer at such a time as this against the injustice of the malt-tax. A needy author, who was writing his Life and Times, was wont to solicit subscriptions in this way: "All those friends who subscribe to the work will be mentioned in it;" and then he would add, still more significantly, "and so will those who *don't*." Now, in writing the Life and Death of the Malt-tax, we must put the case precisely in the same home fashion. All those friends who give us their aid will be mentioned hereafter, and so will those who do *not*. In either case, if the new Repeal Association puts the question properly, there will be something to talk about at the next election.

HALESWORTH FARMERS' CLUB.

A meeting of this club was held at the Angel, Halesworth, Mr. Charles Lenny, of Wissett, in the chair.

The subject for discussion was "The Advantages or Disadvantages of the Malt-tax," introduced by Mr Robert Haward, of Spexhall-road.

Mr. HAWARD said that, before entering on the consideration of his subject, he would, with the Chairman's permission, trace the history of the tax from its first imposition in 1697 to the present time, by which they would see that it was first imposed as a war tax, and had been from time to time increased, to enable successive governments to carry on those accursed and destructive foreign wars which had carried bloodshed and devastation into many countries, and caused misery and privation in our own. The first tax was laid on malt in the reign of William the Third, to assist that monarch in his endeavours to humble the pride of Louis the Fourteenth. Its amount was 4s. per qr., or 6d. per bushel; but when peace was made, the tax was still continued; and at the close of the reign of George the Second, the country being then engaged in what was called the "Seven Years' War," when Prussia was subsidized by this country, it was increased to 6s. per qr. In the year 1780, during the war which ended in the independence of the United States of America, the tax was increased to 10s. 10d. per qr.; and during the long and unnecessary war with our French neighbours, which, with two short intervals of peace, lasted for 22 years, it was raised first (in 1802) to 19s. 4d., and again (in 1803) to the highest point it ever attained—35s. 10d. per qr. It remained at this high pivot until the conclusion of peace in 1816, when it was reduced to 19s. 4d., but in 1819 was again increased to 28s. 10d. The year 1822 was a period of almost-unequalled agricultural distress; and in that year the duty was reduced to 20s. 8d. In 1840, there being a great deficiency of revenue, five per cent. was added to it, bringing it to 21s. 8d.; and in 1854, during the Russian war, it was advanced to 32s., but again reduced to 21s. 8d. on the conclusion of peace in 1857, at which point it has since remained. Such was the record of one of the greatest public burdens now pressing on the British farmer; and he now came to the consideration of the subject he had undertaken to bring before them. Having considered the question, he thought, in all, or nearly all, its bearings, he had been able to discover only one advantage resulting from this impost—the noble revenue it brought into the Exchequer, which, in the twelve years commencing at 1845 and ending at 1858, and omitting the two exceptional years 1855 and 1856, had averaged £4,765,404 per annum; but as it had slightly increased in the years 1857 and 1858, when it stood at £5,314,465 and £5,155,803, he thought they might safely say there was, in round numbers, a revenue of five millions annually received from the tax on malt. This was, of course, an advantage; but he thought he should be able to show them how greatly it was counterbalanced by the evils accruing from it. Should gentlemen present be able to point out other advantages, he, for one, should be disabused of the idea he entertained that the tax was an almost unmitigated evil. In entering on the second branch of his subject —the disadvantage of the malt-tax—he wished, first of all, to explain that he should look at the whole matter from a free-trade point of view, and in no narrow or restricted light. He agreed, on the whole, with Mr. Gladstone's new Budget, but thought the British corn-growers were hardly treated by the malt-duty not having been reduced as well as the duty on hops and French wines and spirits. He wished also to state that, as regarded the facts and figures he should produce and had produced, he was under great obligations to Mr. Edward Ball, the excellent M.P. for Cambridgeshire; to Mr. G. P. Tuxford, the proprietor of the *Mark Lane Express;* to Mr. Corbet, the secretary of the London Farmers' Club, under whose auspices the Anti-Malt-Tax Prize Essay was issued; and to other gentlemen. Following the course indicated in this pamphlet, he should endeavour to bring before them—1st, the disadvantage to the farmer; 2nd, the disadvantage to the labourer; 3rd, the disadvantage to the public in general. First: One of the evils resulting to the British farmer from this tax was, that he was not allowed to use his own productions in the way most profitable to him. He would ask why, in fattening their beasts or their sheep, they should be compelled to purchase foreign oilcake and other foreign productions, such as maize, locusts, &c., and be prevented using malt, an article ready to their hand? Why should they be compelled to send to the East Indies, the United States, the Black Sea, or the Baltic for their produce, while prevented by this tax from using their own? Why should the foreign grazier be allowed to use untaxed malt in fattening his cattle, and import those cattle duty free to compete with those fed by the British grazier on malt burdened with a heavy duty? He had been told that malt used for feeding cattle was of too laxative a nature to be used with advantage; but he would ask who in his senses would feed cattle entirely upon malt? Would any man feed entirely on linseed, on oilcake, or on corn? Most assuredly not. Either of these valuable feeding substances would be mixed with chaff, with hay, and with roots, and given, as an expensive article of food, in small and judicious quantities. But as one fact was worth many theories, he would bring before them an experiment tried in 1816, by that distinguished practical agriculturist, Mr. John Hudson, of Castle Acre, a gentleman who had made more money by grazing than almost any farmer in England, and it was well known that where Mr. Hudson led they might very safely follow. He selected six beasts, three of which he fed upon barley-meal, and three upon ground malt, their other food being alike. They were all sent to London, and those fed upon malt realized upwards of £6, or £2 per head more than those fattened with barley. They were small Highland Scots, weighing when fat from 40 to 50 stones of 14lbs., and the price of beef being at the time very low, they realized only about 6s. 6d. per stone. And that was not all, for the beasts fed upon malt were selected from the others, and purchased by Her Majesty's purveyor, as being finer grained and altogether of better quality than the others, and this without knowing how they had been fed. Mr. Hudson, in his evidence before the Committee of the House of Lords, afterwards offered to back any number of bullocks fed on malt against any number fed on barley for £100, and he stated that he believed 5 quarters of malt equal to a ton of linseed cake. Mr. Robert Smith, an extensive farmer and estate agent in Devonshire, had also used malt advantageously in fattening sheep, and it was a well-known fact that malt was used to some extent in getting into condition almost all the cattle shown for prizes in our great agricultural exhibitions. Another disadvantage was that the tax vastly decreased the consumption, and reduced the price which the farmer would otherwise receive for his barley. The barley grown in England was most of it very superior in quality to the foreign article, which was coarse and steely, and had been found to malt unkindly. They had been told that the malt tax, coupled with the prohibition which had hitherto existed to the importation of foreign malt, was a protection to the British farmer; but he was now glad to see the prohibition about to be removed, and with this removal they ought to have taken off not less than half the duty. As the British farmer was now matched against his foreign competitors, he ought like them to be unfettered, otherwise it was like setting two men to race with each other, the one having his legs tied while the other's were at liberty. There were only some five or six English counties which sent fine barleys to the London market; and Suffolk being one of these, the tax was more felt by them than it was by Lincolnshire and other counties where the barley was comparatively inferior; although even in those counties the operation of the tax was severely felt, as it prevented them from malting their ordinary barley at all. When the duty was low, there was a large trade in malt between the West of England and Ireland; but the increase of the duty in 1780 effectually put a stop to the trade, which had never been revived. In former years a malthouse used to be found in almost every village; but the malt-tax had thrown the trade into the hands of a few large maltsters, and nearly all the small houses had disappeared. Another injustice which the malt-tax would now effect would be that while the owners of foreign vineyards would hereafter be allowed to bring in their manufactured produce at a small duty, British beer would still be almost prohibited from coming into competition with their cheap wines, owing to the enormous duty on both malt and hops. As he had said before, he was in favour of free trade; but if it was to be free trade, let it not be a one-sided affair, but let the British farmer have a fair stand-up fight with his foreign competitor. Give him a clear stage and no favour, and he for one had no fear of the result. Secondly, one of the disadvantages of the tax to the labouring classes was that it prevented them from brewing their own beer. He would show them how, as the duty on malt had increased, the consumption had fallen, until from a consumption of five bushels of malt per head of the population in 1750, with a duty of 4s. a quarter, it had decreased to a consumption of one and a-half bushels per head in 1855, with a duty of 32s. per quarter. The subjoined table would show how, with an increasing population, the advancing duty had nearly kept the consumption stationary; and although the blessings of free trade had within the last few years slightly accelerated the consumption, there could be no doubt but a diminished duty would add to the number of quarters used; so that the ratio would soon show a most gratifying improvement.

Years.	Population in millions.	Duty per qr.	Bushels Malt made.	Bushels per head.
1750	6	4s.	29,284,786	5
1770	7¼	6s.	24,452,960	3½
1790	8½	10s. 10d.	21,976,959	2½
1805	9½	35s. 10d.	21,665,204	2¼
1813	10½	„	21,701,356	2
1821	12	28s. 10d.	26,138,437	2¼
1831	14	20s. 8d.	32,963,470	2¼
1841	16	21s. 8d.	30,956,394	Under 2
1851	18	„	34,687,313	Under 2
1853	18¼	„	36,301,602	Under 2
1855	18¾	32s.	30,199,710	1
1858	19½	21s. 8d.	38,074,622	Under 2½

Now, whatever the duty, the upper and middle classes consumed about the same quantity of malt liquors per year, so that this diminished consumption was caused almost entirely by the inability of the poorer classes to pay the enhanced price which the high duty created. They were compelled to purchase tea, coffee, and other foreign productions, and to forego the use of the national beverage, or if they ventured to indulge in what they could not brew at home, they were driven to the tap-rooms of public-houses or to the low beer-houses, which it was well known were the resort of the most dissolute and debauched members of society. And when once the man had formed a habit of mixing with such company and frequenting such places, his self-respect was destroyed and his wife and family were forgotten and defrauded, his children grew up to be inmates of workhouses or prisons, and that happy home, where but for this tax he might have enjoyed his pint of home-brewed beer with his family, became a scene of misery, destitution, and moral and eternal ruin. It was a well-known fact that beer always had been, and he believed always would be, the national beverage. It was a good old Saxon drink, and they would find it mentioned in the history of England as being drunk in the halls of the great in very early times. It was originally imported from Germany, a country in which beer had always taken a high place as an article of general use. But suppose the poor man, instead of going to the ale-house for his beer, should send there for it, and drink it at home, let them see how the malt-tax enhanced the price of it. Take the average value of a quarter of barley at 32s., the effect of the tax would be as follows:—

	£	s.	d.
One quarter of barley............	1	12	0
Malt-duty........................	1	1	8
	2	13	8
Maltster's profit 10 per cent.......	0	5	4
	2	19	0
Brewer's profit 10 per cent........	0	6	0
	3	5	0
Publican's profit 10 per cent.......	0	6	6
	£3	11	6

Being an enhancement of 120 per cent. beyond the price at which, but for the tax, it might be purchased. When the duty was low the custom was for every labourer to take his keg of table beer to his work; but this was now never seen, except at the beginning of harvest. And how much more good ale would the farmers give their labourers, when their labour was unusually toilsome, but for the high price of malt! They had, no doubt, often grieved to see their men, covered with perspiration, run to a pond in the harvest-field, and drink like beasts from it. And was it not also injurious to their masters that, for want of a sufficiency of this nutritious beverage, their men became so soon exhausted, and unable to get through that fair amount of labour they wished to do? Thirdly, Its disadvantage to the public at large. It led, in the first place, to great adulteration in the beer sold to the public, and whether that adulteration was practised by the brewer or the retailer, whether it consisted in the use of sugar, molasses, or some more deleterious articles, he of course did not know; but it had been publicly stated, and never contradicted, that whereas in 1799 the London brewers consumed 700,000 quarters more malt than they did in 1830, in the latter year they produced a million barrels more beer than in the former one. He must leave such a fact for the brewers themselves to settle, but he asked such of them as were in the habit of drinking a glass of good home-brewed beer whether much of that sold to them was not nauseous in the extreme. The duties on tea and coffee had been reduced, and the result was a large and increasing consumption; and why, in the case of the malt-tax, should no reduction be given? In the case of the paper-duty they had been told that it restricted the progress of a great branch of domestic industry; and how much more strongly did this apply to the manufacture of malt? the absurd excise-restrictions preventing any improvement in the mode of making it, and creating impediments to its being made at all during one-half of the year. In concluding his address, Mr. Haward asked his hearers whether the movement now on foot against this obnoxious impost was to be a mere spasmodic cry, or a well-sustained and continued agitation. He read an extract from the *Halesworth Times* of that day, showing that, were the farmers united in their efforts, the reduction of the tax must assuredly follow. He quoted a letter which he had a few days before received from Mr. Ball, M.P., of which the following is an extract:—"Every trade is contending against the budget but agriculture. We suffer from our own indifference. I wish your friends in Suffolk may do something. I receive petitions from all parties save farmers: from ourselves none! So we perish." Let them look at how the opponents of the window-duty proceeded. They felt the tax was unjust, and they never ceased to denounce it until it was repealed. Then there was the glass-duty, which was got rid of by constant and energetic agitation. And how were the corn-laws repealed? Why by a body of men who felt their injustice banding themselves together in opposition to them. They felt their cause was a just one, and they took a strenuous and decided course of agitation, until their circulation of nine millions of publications, and their appeals to what was right, extorted from a Conservative ministry and a Conservative parliament such a measure of commercial emancipation as had never before been passed since England was a nation. And let them now look at the paper-duty. For eleven long years had its opponents been steadily at work opposing its impolicy and unfairness, and now it was to be for ever abolished. Had farmers stuck to the malt-tax half so well as the interests he had named, depend upon it, if it had not been before now altogether put an end to, it would at least have been very materially reduced. It was apathy that ruined the British farmer. He himself was a subscriber to the Anti-Corn-Law League, but he expected that in agitating for free trade in corn he was agitating for free trade in other things. He quoted a speech made in 1839 by Mr. C. P. Villiers, a member of the present Government, who said in the House of Commons, "Would the landed interest be willing, if the malt tax were taken off, to release the country from the tax on corn? For of this he was sure, that all those who were now injured by the existence of the corn laws would be ready (nay be anxious) to get rid of it (the malt tax). By acceding to these terms the produce of the malt tax would be lost to the revenue no doubt. Four millions and a-half is a small sum indeed, compared with what might be raised through the medium of taxation, if the energy of the country is allowed its full and natural play." Sir James Graham said, "He was convinced that, if they repealed the corn laws the malt tax would not survive a single year, and why should the farmers be prevented from growing beet-root sugar and tobacco?" And the great Sir Robert Peel declared, "As a farmer to the free traders, let me grow my own tobacco, let me manufacture and consume my own malt untaxed. If the articles I raise and sell are to be exempt from protection, let the articles I buy be exempt also." He wished to ask, how had these declarations been fulfilled? Did farmers without reason complain of unfair treatment? The remedy for this injustice was in the farmers' own hands, if they thought fit to use it. Let them send to Parliament men of business, who would work for them in season and out of season. He held in his hand the division list on the last motion on the malt tax. The motion was made by Mr. Ball, on the 12th of July, 1853, and its object was to allow the British farmers to malt their own barley for their own consumption. It was lost by 69 against 73, and not a single Suffolk member was present. Had all four voted for it, as they ought to have done, it would have been carried, as the then Speaker was member for Hampshire, a malting county. If they want to succeed, their efforts must not die with that meeting, but they must make a long pull, a strong pull, and a pull altogether. If they did so, they would most assuredly, at no distant day, meet with that success which their cause so undoubtedly deserved.

A discussion ensued, in which Mr. J. R. Cooper, Mr. R. Tacon, Mr. E. Deck, Mr. T. N. Turner, Mr. G. Haward, and Mr. J. Howlett, the Chairman took part, and a petition to the House of Commons was unanimously agreed to, and numerously signed.

IPSWICH FARMERS' CLUB.

To the Ipswich Farmers' Club belongs the credit of having revived the agitation—which some years since attained considerable strength, but that of late has been allowed to languish—for a repeal of the duty on malt. The club met on Tuesday, in considerable force, in the large room at the Great White Horse, and the gathering, which was strictly a farmers' meeting—no noble lords or honourables being allowed to monopolize the talking—was presided over by Mr. Hare, of Weston.

The **CHAIRMAN**, in opening the proceedings, said British farmers were now living in what were called free-trade times, and under such circumstances they considered that they should not be justly dealt with until the obnoxious malt-tax was removed. Viewed in any light, politically or morally, the abolition of the malt-tax must be regarded as a great boon.

Mr. W. **BIDDELL** moved the first resolution, and observed that the movement was one of which he so entirely approved, that he cheerfully gave it whatever support he could. Some years back he had not taken any part in the matter; but since he had seen the result of recent legislation, and since he had observed that nothing was to be done without agitation, he had become a hearty promoter of the object at present contemplated. In almost all cases agitation had been successful, and no doubt the present good cause would be successful also, for it was one which bespoke the support not only of disappointed Protectionists, but also of the Liberal party. The resolution with which he was entrusted was to the effect "that in the opinion of the meeting the malt-tax was prejudicial to the interests of British farmers, both as producers of barley and meat; that the tax could only be justified under a system of Protection; and that under the present free-trade arrangements it was unjust and indefensible." He believed it to be the fact that the tax was, as stated in the resolution, indefensible. Some persons might say that the present was an improper time for commencing an agitation from which a loss to the revenue might arise; but if this was the case, why had the Government thought fit to remit a large amount of revenue on the paper and other duties? A reduction of the malt-duty would only be obtained by agitation, for now, he was sorry to say, nothing was done without it; the people carried everything, and the Government did everything by the people. With regard to the decrease of revenue, which some persons might anticipate from a reduction of the duty, he owned it was a point on which he was not altogether clear; but the experience of the past showed that any increase of the duty had been followed by a decrease of revenue, and although this might not be conclusive, still it was strong evidence that, as a higher duty had been attended with a decrease, so a lower duty might be attended with an increase of revenue. French wines and other drinks which would enter largely into competition with malt were now about to be brought in at a great reduction of duty; and not only was this to be done, but Mr. Gladstone had also decided that in certain houses, under a low licence, wine and other foreign beverages should be drunk, while the beverage in which farmers were so much interested was to be prohibited. This he (Mr. Biddell) contended was a signal injustice to the agricultural interest. He might be told that one might always get beer at such places as it was now proposed to license; but he believed the managers would resort to every evasion to secure a sale of their own articles. Would the manufacturing interest submit quietly to such grievances as farmers had now to complain of? The malt-duty was a tax of from 30 to 40 per cent. upon what would always be the national beverage, and manufacturers would besiege the Chancellor of the Exchequer with deputations, and move the world, to get such a tax off any of their commodities. Farmers must be a quiet set of beings to bear the grievance so quietly, and he hoped the time would come when Farmers' Clubs would enter a little more fully into politics as affecting the agricultural interest. He could not but think that Farmers' Clubs had adopted a suicidal course in excluding politics, and he hoped that for the future some attention would be paid to them, because he trusted the tempers of farmers were such now-a-days as to enable them to discuss questions without thinking the worse of those who were opposed to them. He had been opposed to the abolition of Protection; but he did not particularly regret it now, and although farmers could not perhaps stand up for a reduction of the malt-duty under the old system, he thought they might fairly claim it now. Formerly there was a great deal of what might be called Government capital engaged in the malt-trade, in consequence of the duty not being called in till after the malt was made; but this great outwork and defence of the malt-tax was now thrown down, and the way being thus cleared the attack must now be proceeded with. He differed from a noted free trader with whom he was speaking not long since, as to the effects of the malt-tax. If the tax only injured barley to the extent of 1s. per coomb, the loss must be considerable. But he believed the tax prevented a great deal of the barley produced being made into malt at all; and taking it altogether he believed the duty was a most injurious one to the farmer.

Mr. **BARTHROPP**, in seconding the resolution, said he held it to be most unjust that the farmers of England should not be allowed to do as they liked with their own produce. They had been compelled by recent legislation to grow wheat in open competition with the world; and as they had had free trade forced down their throats, they ought now to insist upon having free trade in everything else. It was preposterous that Frenchmen and inhabitants of other countries more suited to the growth of barley than France should be able to grow their malt, feed their cattle with it, and send it over to England duty free, while Englishmen were not allowed to do the same. Mr. Hudson, of Castleacre—a most eminent authority—recently observed that he questioned whether any of the members of the House of Commons, who made our laws and imposed our taxes upon us, had ever calculated what the produce of an acre of barley paid in malt-duty. An acre, producing 5 qrs. of barley, would, when it was made into malt, pay at the rate of £5 13s. 9d. per acre. Mr. Hudson grew 200 acres of barley every year; and the amount of duty on this was £1,137 10s., while the rent was only £250, leaving the duty £887 10s. in excess of the rent. With such a statement before them, farmers must not continue quiet, as they had done, but must agitate the question, and endeavour to procure a remission of the grievance under which they had so long laboured.

The resolution was carried unanimously.

Mr. R. **BOND** next addressed the meeting, and expressed his belief that, in agitating the question, farmers must look to the kingdom generally for support. He believed that the tax was indefensible, and that it worked decidedly badly in practice. He was convinced that it had the effect of vastly encouraging adulteration, fostering monopolies, and checking the wholesome consumption and production of barley; and that the manufacturers of Manchester, Leeds, or Birmingham would not for a moment entertain such a tax upon their products. The iron-lords or coal-owners would not submit, and there was no reason why the farmers should submit either, to such a heavy impost. It might be said that it would be only fair and proper to tax Nature's products in the shape of coal or iron; but in taxing malt, you taxed Nature's gift and man's production combined: and agriculturists were vastly cramped in their operations by the tax. It seemed to be expected that poor agriculture was to bear the burden without complaint; but if farmers continued to submit to it uncomplainingly, they would be decidedly wrong. He might be asked what he would substitute for the malt-tax; and, in reply, he would say, substitute a just tax for an unjust one. It could not be right to tax the few for the many, and lay a heavy burden upon barley produce. It certainly was not just in principle to tax the poor man's beverage, and let in the rich man's wine comparatively duty-free. There were many of the tee-total class who considered that beer was not necessary to a poor man; but when his daily diet was remembered, when it was recollected that he lived upon bread, and seldom tasted meat, it would be admitted that it was a necessary to him: and he (Mr. Bond) was for giving the labourer all the comforts possible, and not for curtailing them. He would give the poor man a good wholesome glass of beer, instead of the adulterated article—a decoction of tobacco, coculus indicus, &c., and in which malt bore but a very small proportion—now placed before him. The effect of this latter kind of drink was to make a man beastly drunk; and philanthropy, stepping in, sought to cure the evil by reducing the number of beerhouses, the truth being that the duty, and the restrictions of monopolists, caused the curse of which we had to complain. Beer was at present made a luxury to the poor man; and therefore, when he got it, he was apt to take too much, just as a boy was prone to indulge too freely in a tart-shop or in plum-pudding; and, not being able to get beer at home, he was driven to the public-house, where he met a lot of "jolly good fellows," and became excited with a fluid such as no man could drink without such a result. The poaching scheme or henroost robbery was then entertained; for beer-houses were undoubtedly, under the present system, the spots in which many such crimes were concocted. Traps were set to catch men; prisons received them afterwards; the weary round went on; and the system became a national manufactory of crime. Take away the tax, and down would fall monopolies and adulterations, and give a man comfort at his home, and up would spring rationality, sobriety, and moderation. How was it with the middle classes? Did they meet to get drunk, or for the mere purpose of drinking? No: they went out to enjoy themselves; and he believed, if good beer was given to the labouring classes, and it was made comparatively common, they would tread in the footsteps of those above them. At present, adulteration and immorality appeared to go hand in hand. If it was only for the sake of the poor man—for the sake of increasing his sobriety, health, and enjoyment—he (Mr. Bond) called upon agriculturists to pull away hard and sharp, and they might depend upon succeeding. He believed Mr. Hudson was perfectly correct in stating that the malt-tax, as it at present stood, amounted to about 300 per cent. upon the rental value of the land. He (Mr. Bond) considered the following were injurious influences to the tenants or producers:

In Malt Tax	70 per cent.
,, Adulteration	70 per cent.
,, Brewing Monopoly	10 per cent.
,, Excise Restrictions	10 per cent.
,, Licensing ditto	10 per cent.
,, Prohibition to Labour	30 per cent.
,, Ditto Stock	10 per cent.

He knew the consumer paid the duty; and past experience with regard to sugar, coffee, and tea proved that a high duty seriously curtailed consumption. In the instance of tea, the duty was a few years since lowered 1s. The consumption immediately increased 80 per cent.; while it fell to its former amount immediately the tax was put on again: and he believed that, if the malt-duty were removed, the quantity of barley and malt required would be three times what it was now. At present, adulteration and high duties checked consumption, and substituted an impure for a pure article. From 1848 to 1858 the population increased 14 per cent.; but the increase in the consumption of barley was only 10 per cent., while in the same period the increase in the consumption of tea was 50 per cent. If this was a natural result, it would be all well and good; but the popular taste was literally driven from beer to tea and other articles, because men did not like to be poisoned, but wanted something they could drink and enjoy. He hoped all farmers would unite as one man to pull down a tax which he considered unfair on their industry, a fetter on their enterprise, and an oppression towards the poor man—a tax which was productive of monopolies, adulterations, drunkenness, and crime (cheers). The resolution he had to submit to the meeting was to the effect "that the malt-tax bore heavily upon the labouring classes, being, in its operation, injurious to their health and morals."

Mr. Dawson seconded the resolution, which was agreed to.

Mr. Hitchcock moved "that those parts of the budget relating to the admission of French wines and foreign malt, unaccompanied by any proposition for the reduction of the duty levied on malt produced at home, were most unjust to the producer and manufacturer of British barley and malt, and to the consumer of British beer, and called for the loudest remonstrances on the part of those affected thereby." Mr. Hitchcock said he would throw overboard the philanthropic part of the case, as it had been already so well stated by Mr. Bond; but he considered that the interests of the farmers were specially affected by the operation of the budget, and he thought that it was their business to address themselves to their special grievances. The object aimed at in the budget appeared to be to extend the consumption of foreign wines, and to reduce perhaps the consumption of British beer. At all events, this was the tendency of the budget; but it must be to the interest of the farmer that there should be more beer and less wine consumed, rather than less beer and more wine. He thought farmers should look at what was practicable. It was all very well to talk of the repeal of the malt-tax, but he believed the malt-tax could not be repealed all at once. Mr. Biddell had assumed that the malt-tax ought not to be retained under free trade, although it was admissible under a protective system; but the malt-tax existed before Protection, and, being an old tax, it could not be expected that it would be entirely remitted. The elasticity of the revenue should, however, be taken into account; and if the Chancellor of the Exchequer retained a portion of the duty, say one-half, it would probably realize as much as before. If the revenue derived from French wines was expected to be as great with a low as with a high duty, why not try the same principle with respect to the malt-tax? The malt-tax dated back to 1678, and farmers could hardly expect its entire removal; but they might fairly demand its reduction, which would no doubt lead to an increased consumption; for in 1853, when Mr. Gladstone raised the duty from 2s. 7½d. to 4s. 1½d., the immediate effect was a diminution in the consumption from 36,000,000 to 30,000,000 bushels, while as soon as the increased duty was taken off there was as much consumed as before. What was true in 1853 ought to be true in 1860 or 1861; for they could hardly be so sanguine as to suppose they would get anything this year, although by agitation they might lay the foundation of a reduction at some future period. Mr. M'Culloch, who was always quoted as a great free trade authority, argued that if the wine duties were reduced, and the consumption increased to the extent anticipated, there would be a considerable decrease in the consumption of beer; and to do justice to all, it would be necessary to make corresponding reductions in the malt duty, for, he added, "there should be no favouritism in taxation." Mr. Gladstone's policy towards the British maltster was most unfair, and certainly not conceived in the spirit of free trade. A case could not be made out against the prohibition of foreign malt, which was only prohibited as a protection to the revenue, that there should be no smuggling; but what he complained of in Mr. Gladstone's policy was that it required the English maltster to pay his duty within a certain time, while the foreigner was to be at liberty to let his malt remain in bond as long as he pleased. At the end of April there must be six months' stock in hand; and therefore on a great deal of the malt required for brewing in October and November following, the duty would have to be paid by the Gladstone proposition by the end of June, while the foreigner could let his malt lie in bond as long as he liked. This could not be fair; for under such a system a foreigner would be able to carry on his business with half the capital required by an English maltster. If the foreigner was to be allowed to bond his malt, why should not the Englishman do the same? The *Times* lately objected to being made collector of the revenue; but under the system proposed, the maltster would be placed in such a position. If a farmer sold his barley to a maltster, and the latter failed, the farmer merely lost his barley; but if a brewer failed, the maltster would lose his malt and the duty too (laughter). This was a great grievance, which would tell indirectly on the price of barley; for whatever affected the maltster must affect the farmer also. The duty, he considered, ought not to be demanded from a maltster till the malt actually left his premises. In conclusion, Mr. Hitchcock expressed his opinion that a division of benefits—which would be shared in by farmer, maltster, and labourer—would follow a reduction of the duty.

Mr. Beckett, in seconding the resolution, said it was clear that Mr. Gladstone was no friend of the farmers. In his last budget the rich man and he who fared sumptuously every day appeared to have his first consideration; the manufacturers the second; while the poor man living upon hard-earned bread had no place at all in his thoughts. He (Mr. Beckett) could not understand a man's being called a free-trader and placing such high restrictions upon agricultural produce. Mr. Gladstone held the British farmer up to ridicule, dangling him before the House of Commons as a person in most prosperous circumstances; but although Mr. Gladstone called the farmer his friend, he (Mr. Beckett) would much rather have had proper consideration as regards the repeal of the malt-tax than high-flowing professions of friendship. Mr. Gladstone drew his conclusions very fallaciously from the income-tax returns, the tax paid in schedule B being in proportion to the rent, and being paid whether the farmer had a profit or not. Many of those present know that lately they had not received a shilling of interest for money invested in agriculture. He thought it a great pity that the repeal of the tax should be compromised (and he differed with great diffidence from a gentleman of the experience and learning which characterized one of the members for Suffolk, who had proposed such an arrangement) by a paltry 1s. per qr. upon foreign malt brought into this country. Farmers ought to show that they were not disposed to compromise the matter by less than a reduction of half the present duty, the repeal of the whole to follow when the Emperor of the French and Italians could settle their knotty differences.

The resolution was put and carried.

Mr. R. HAWARD, of Spexhall, next addressed the meeting at considerable length, reviewing the rise and progress of the tax—in consequence, as he argued, of useless wars—from the reign of William III. to the present day. Proceeding next to the consideration of the effects of the tax upon the agricultural interest, Mr. Haward adverted to the experiment made by Mr. Hudson, of Castleacre, as to the relative advantages of feeding cattle with malt and feeding them with barley. Mr. Hudson fattened three beasts with barley and three with malt, and the latter made £2 per head more than the former. It had been stated that barley was better than malt for feeding stock, and an experiment had been put forward which was made by an eminent Scotch chemist at the request of the Government of the day. This Scotch chemist, a Dr. Thompson, was requested to feed some stock upon malt and barley, and instead of, as any man of business would have done, putting up some beasts and sheep, and trying them with equal quantities one with another, he put up a couple of cows, and fed one upon barley and the other upon malt. The cow fed upon barley gave more butter and milk than the other; and one might naturally suppose it would be so, because those who had kept a dairy of cows knew that if they were fed upon too large a quantity of saccharine food they would not get on. Yet Dr. Thompson's authority was put against Mr. Hudson's and Mr. Smith's, of Exmoor, in Devonshire. A small quantity of malt was generally used with the prize animals at the Smithfield Shows, as it was found to put a better face upon their meat and finish them off better; and the three malt-fed beasts of Mr. Hudson, when shown in Smithfield, were selected as superior to those fed upon barley. If, then, it was convincingly proved that malt could be used to advantage in fattening cattle, why should British farmers be compelled to forego the use of an article which they grew themselves, and which they could manufacture themselves but for the duty? This year there had been a great deal of inferior barley which the maltsters could not buy in consequence of the duty, but much of it might in the absence of the duty have been used for fattening purposes. Yet the foreigner was actually allowed to fatten his beasts with malt, and bring them here duty free, to compete with English cattle! He was a free trader, but he was opposed to corn and meat coming in duty free, while such an exorbitant tax was put upon English malt that farmers were compelled to buy foreign articles. Only a few counties in England produced fine malting barleys; a better article would always, under natural circumstances, command a better price; and why should the malt duty interfere and prevent the barleys of Suffolk, Essex, Hertfordshire, Hampshire, and one or two more districts obtaining the price they ought to have? He had no objection to the reduction of duties upon foreign wines and spirits; but if the object was to throw beer on one side altogether, let it be stated openly; let the promoters of such a system say at once, "We wish that foreign wines and spirits should take the place of British beer; you English farmers are nobody, and let your barley go just anywhere." The prohibition upon foreign malt was now removed, but all he asked for was a fair field and no favour. He was not afraid of foreign farmers. The improved mode of agriculture, and the quantity of stock now being kept, must convince those who had seen the continent, and noticed the manner in which foreigners cultivated their lands, that Englishmen had nothing to fear from foreign farmers, so long as they were placed in an equal position with them. This was not, however, the case at present. The malt duty was always allowed upon all beer exported; and why should the foreigner have his beer free of malt duty, while the Englishman was compelled to pay a heavy duty upon it? As regards the labourers, the tax must be considered a tremendous hardship; now, instead of having a glass of good beer, they might be sometimes seen running to a pond to quench their thirst! If there were no malt duty there would not be adulteration as at present, but they would be able to have a good wholesome beverage at their homes, greatly to the comfort of themselves and their families. He might be asked how he was going to prove that adulteration prevailed; but it had been stated, and never contradicted, that in 1799 the London brewers used more barley than they did in 1830, although in the latter year they produced 1,000,000 barrels more beer. To bring about this result there must have been awful adulteration (laughter.) It had been stated that the people had now become more fond than formerly of tea and coffee, and that the consumption of malt would never rise to its former point; this might be true to some extent, but he believed the people of England still loved a glass of good beer, and that a reduction of the duty on malt would lead to a vastly increased consumption, and consequently to a greater demand for barley. Adverting to the success which had attended the agitation for the repeal of the window duty, the corn laws, the newspaper stamp, &c., Mr. Haward argued that the malt tax was as unfair as any of these imposts, and that although nothing would probably be got this year in the way of its abatement, if an agitation was commenced and continued another year something must be done. If the matter was kept steadily before the public the tax would be got rid of. Meetings should be got up in every market-town, and paid agents should be employed to go into the manufacturing districts, and explain to the people why they were prevented having a good class of beer they would then, he was sure, unite with the agricultural interests in opposing the tax, and it would fall to the ground. An Anti-Malt Society should be organized in London, and a good fund raised to enable it to work effectively. The resolution submitted by Mr. Haward was to the effect "that petitions in accordance with the foregoing resolutions be prepared for signature in as many parishes as possible, and that a committee be appointed to carry the suggestion into effect." Mr. Haward before resuming his seat stated that fifty petitions with 3,000 signatures had been sent up from the Blything Union (applause.)

Mr. PACKARD seconded the resolution, which was put and agreed to.

Mr. HAWKINS said he supported Mr. Cobden in his free-trade efforts, and Mr. Cobden promised that if free-trade in corn could be obtained, he would assist the farmers to get the malt-tax repealed. Sir Robert Peel also said, if the corn laws were once repealed, the repeal of the malt-tax must follow; but some farmers had up to the present time clung to the malt-tax as a remnant of protection. It might be asked what tax could be substituted for the malt duty; but that was not the farmers' but the Chancellor of the Exchequer's business. The question for the farmers to consider was, whether free-trade having reduced the price of wheat 8s. or 10s. per qr., they could afford to sell their barley at the same price as before, especially as a more expensive preparation was required for barley than for any other crop. He agreed with a former speaker, that last year a good deal of barley, which had not been used, might have been made into very decent malt, if the farmer had been left to himself. It was no use for farmers to wait till their landlords came forward; their rents had not decreased, but the tenant's profits had seriously diminished, and it was doubtful whether they would be able to hold their own. No farmer, if he had to sell, in the ordinary run of years, could afford to sell his barley at 10s. or 12s. per coomb. As to the antiquity of the tax, if antiquity was to be the rule, the Chancellor of the Exchequer had better revive the poll-tax, since the population had greatly increased (laughter). The simple question was whether farmers could afford, under present circumstances, to pay a tax of 100 per cent. upon their barley. He did not consider that the landlord interest was against them; if they did not get rid of the malt-tax they must be prepared with something else, for blood could not be drawn out of a post, and the thing was becoming more oppressive every year. The demand for fine ales had rendered barley one of the most precarious crops to the farmer; and perhaps it would have to be looked to, rather than wheat. Foreign competition was becoming more severe every year, and he thought farmers were bound to demand the repeal of the present tax altogether. After the repeal of the corn laws, the Duke of Bedford called the attention of Lord John Russell to the subject; and his lordship said the farmers might have then had a repeal of the tax if they had asked for it, but they were then so imbued with protection, of which they thought the duty a remnant, that they did not ask for its repeal. Mr. Hawkins moved "the appointment of a committee, to consider the practicablity of establishing an Anti-Malt-tax Association."

Mr. H. **Biddell**, in seconding the resolution, called upon the agricultural interest generally to give a cordial and hearty support to the movement.

The resolution was unanimously adopted.

Mr. A. **Packard** proposed that the resolutions should be printed, and sent to every member of the House of Commons.

Mr. **Skeet** seconded the motion, which was agreed to.

Mr. **Perry** moved a vote of thanks to those gentlemen who had called the attention of Parliament to the question. Mr. Perry stated that Sir Fitzroy Kelly proposed to submit two or three resolutions on the subject to the House of Commons; and that on the following day a deputation from the Club would have a conference with Sir Fitzroy at his country residence, The Chantry, near Ipswich.

Mr. **Rist** seconded the vote of thanks, which was adopted *nem. con.*

Mr. **Everitt** proposed that a subscription should be commenced, to defray any preliminary expenses which it might be necessary to incur.

It was agreed that this should be done.

Mr. **Haward** suggested that the committee appointed should confer with such gentlemen as Mr. Ellman, of Sussex, Mr. Ball, M.P., Mr. Bramston, M.P., Mr. Fisher Hobbs, Mr. Bass, M.P., &c., so as to make the movement a general one.

A vote of thanks to the Chairman closed the proceedings of the evening.

The following is the circular issued:—

Ipswich, April 14th, 1860.

Dear Sirs,—At the request of a numerous body of gentlemen at a public meeting, we the undersigned were elected a committee for the purpose of getting up Petitions to Parliament in favour of a Repeal of the Malt Tax. Assured that your feelings on this question, affecting as it does our labourers and ourselves, are identical with ours, we earnestly solicit your co-operation in the movement.

We therefore venture to ask you to get the accompanying petition signed as numerously as possible by *all classes* in your parish, and to forward the same to Mr. R. Bond, Tavern-street, Ipswich, on or before Thursday, April 19th, in time for Sir F. Kelly's motion in the House of Commons.

We remain, gentlemen, yours respectfully,

Robt. Bond, G. Hare,
Robt. Cobbold Perry, R. L. Everett.
J. M. Dawson,

P.S. When the petitions are received by Mr. Bond, written headings will be substituted for the printed ones.

The Corn Averages.—A letter was recently read at the Ipswich Farmers' Club on this subject, by Mr. J. Mayhew Dawson, of Bucklesham. The discussion was followed by a deputation to Sir Fitzroy Kelly, M.P., who received it on the fifth of this month at his town residence. The result of the interview was a determination to present a petition from every parish in East Suffolk, praying for an improvement in the present system of taking the returns.

THE MALT TAX.

Sir,—I have read with great satisfaction the letters you have published in your truly agricultural Journal—of Mr. Colcott and Mr. Ellman, on the malt-tax, a pressure, under which we farmers and the agricultural and manufacturing labourers of England are suffering.

I question whether any of the Members of the House of Commons, who make our *laws*, and impose the *taxes* upon us, ever made a calculation of the amount of money the produce of an acre of barley pays in the shape of malt duty; therefore I will take the liberty just to inform them.

An acre of Norfolk land, rented at 25s., will produce 5 qrs. of barley, which being made into malt, the duty is £1 1s. 8d. per qr. and 5 per cent., or £5 13s. 9d. per acre.

Now, I grow 200 acres of barley every year, which at the above sum of £5 13s. 9d. per acre, amounts to £1,137 10s. The rent of the 200 acres of land the barley grows upon, is £250, making a difference of £887 10s.

The malt-tax is about equal to the rent of the whole farm.

Where are the poor man's friends, Mr. John Bright, M.P. and Mr. Richard Cobden M.P.? They consent to please the palates of the *rich man*, by admitting French wines at a *low* rate of duty, but *oppress* the *poor man*, by making him pay a *high duty* upon *his* beverage, "*beer*;" for the man who *drinks* the pot of *beer pays the duty*.

I am, Sir, yours truly,

Castleacre Lodge, March 29. John Hudson.

THE WIRE FENCE.

No. 2.

Having the first straining post prepared and fixed in the ground in the manner described in our former paper, the next operation is preparing and setting another straining post, the distance of which from the first must be regulated by the variety of wire intended to be used. If old coiling rope, as heretofore described, the distance should not exceed 50 yards, as the strain of it on the posts is very great; but a distance of 80 or 100 yards may not be too great if the round single strand fencing wire is used. The usual way of procedure, when the first and second strainers are set, is to put in the intermediate small post, but when the fence is a continuous straight line, it is a much better plan to put in the former the entire length of the fence, before commencing to place the intermediates.

In an ordinary four-feet fence the small posts will require to be set two feet in the ground, and consequently must be 6 ft. in length. Should the fence be contiguous to the mansion, or in any conspicuous place, the posts should be sawn to measure 3 in. by 4 in.; but in ordinary cases, where appearance is not a primary object, the thinnings of young larch or oak plantations, set with the bark, does quite well, and makes a tidy and durable fence at a very low figure. I may say that during the last year I have had some considerable lengths of this description erected at an entire cost of 6d. per yard of 4 feet fence. The usual plan is to dig holes, and beat in the small posts; but, in all cases, I prefer to drive them with the puling hammer, being convinced that in the average they will be found firmer, and at about one-half the cost for labour, than by the former method. A piece of iron must be made to fit rather tightly the tops of the posts, to protect them from the action of the hammer while being driven, and with a handle about three feet long, so as to act as a lever to keep them perpendicular. Before putting the intermediates into the line of fence, have two strings fastened through the top and bottom poles of the first straining post, and tightly stretched through and secured at the holes of the second, and which will represent the exact line of the top and bottom wires, and will serve as guides to the true keeping of the posts as the work proceeds.

Buscot Park, Faringdon. W. J. M.

SALE OF THE MILCOTE HERD OF SHORTHORNS.

BY MR. STRAFFORD.

The dispersion of this well-known herd took place the last Wednesday in March, at prices that must be highly satisfactory to the proprietor, Mr. Adkins, and as encouraging to the breeders of Shorthorns generally. There appears to be no lack of interest in this fashionable class of our horned stock, for fresh men are constantly swelling the list of our breeders, while the increasing numbers that attend the sales clearly show the favour the breed receives. The day was the most pleasant of any in 1860. The company was the most numerous we have seen since the sale of Mr. Harvey Combe, at Cobham, last year. The stock, of the best blood, showed in excellent condition; the biddings were very spirited, and the hospitality of the proprietor of the most profuse character. Everything, in fact, went to make it one of the best sales we have ever attended.

The "Sylph" tribe commanded the highest favour, and therefore the highest prices; they have been excellent breeders, a fact proved by thirty-three of the family appearing in the catalogue. Further—and this is very important—though it has been much neglected in this breed, they are good milkers, and will no doubt, by judicious crossing with bulls of another strain of blood to those lately used, produce some most valuable animals. The highest priced cow (lot 10, Charmer 6th) was purchased for 160 guineas, with one other (lot 4, Charmer 3rd) for 92 guineas, by Mr. Pawlett, of Beeston, Beds., the well-known and successful Leicester sheep-breeder, who, we gather, intends during the coming season to bring his flock to the hammer, and for the future (his health being indifferent) to amuse himself with a few Shorthorns. He has commenced well, and we wish him as successful a career with them as he has had with his sheep. These two are very fine cows, and have been regular breeders from two years old. The calf of lot 10, with two other lots 37 and 39, all of the Sylph tribe, were purchased by Mr. Ayres, of Girtford, a friend and neighbour of Mr. Pawlett's.

The men of Kent again mustered strong, from a district where Shorthorns seem to be rapidly gaining ground; Messrs. Hales, Noakes, Tracey, and Wells securing nine lots. Mr. Joseph Robinson, of Clifton-pastures, also closed with No. 5, one of the Sylph tribe, for 70 guineas, to add to his numerous and famous herd. She is a very fine white cow, has hitherto bred all bull calves, but we trust a change of air will have the effect of altering the gender. The "Frill" family realized very good prices; "Flounce," a beautiful heifer, falling into Lord Dartmouth's hands, at 105 guineas; while another, "Frontlet," at 89 guineas, finds its way over the border as an addition to Captain Barclay's herd. The cross with Sir C. Knightley's bulls upon this tribe has told remarkably well. The old bull "Mameluke" was purchased by Mr. Wasey, and remains in the neighbourhood of Milcote. The young bulls were, upon the whole, perhaps not equal to the heifers, but some of them were of excellent quality, and likely to grow into very fine animals. Amongst them Comedian, purchased by Mr. Bramston, M.P., at 105 guineas, "Coxcomb," by Captain Barclay, at 80 guineas, and "Combatant," by Mr. Evans, at 60 guineas; the latter, although closely allied to the herd, had been used, proving the high estimation in which he was held by the owner.

After a most excellent luncheon, reflecting terribly upon that provided at a recent sale of a country squire not a hundred miles from Luton, Mr. Strafford led his company to the ring, where he officiated with his usual ability. The candid manner in which he spoke of the animals, as they presented themselves, was alike highly commendable to himself and his employer, and called forth the approval of the company. We should like to see such a course more frequently adopted at Shorthorn sales; we should then hear less of those vexatious disappointments of which so many have had cause to complain. Mr. Adkins did himself an injustice by putting one or two inferior animals into the catalogue, the average of the sale thereby being considerably reduced; one was a "martin," and the other appeared never to have done well.

Milcote appears admirably adapted for Shorthorns, although we believe there is not much grass-land; yet the lack of this is made up by its being a good root-producing farm, which appeared exceedingly well managed. Indeed, the whole place, house, homestead, and farm, bear the unmistakable signs of the presence of a man of business; one who, while not forgetful of the comforts of his animals, is not unmindful of those that more immediately concern himself and his family. It is now six or seven years since Mr. Adkins had a sale, and we hope that should he ever have another it may be as satisfactory as the one of March 1860.

Amongst the company, which numbered at least 800 persons, were Lord Willoughby de Brooke, the Hon. and Rev. Noel Hill, Sir Charles Knightley (who seemed as much interested as ever), Sir T. Lennard, Captain Barclay; Messrs. Hales, Noakes, Tracey, Wells, from Kent; Mackintosh, Essex; Bland, Lincolnshire; Champion, Reading; Topham, Harrison, Slye, Abbey, Barford, Longland, Robinson, from Northamptonshire; Josh. and Sam. Druce, Bradshaw, Middleton, Hutt, Graves, Cotter, Bryan, from Oxfordshire; Garne and Hewer, Gloucestershire; Charles Howard and Robt. Ayres, Beds.; Allen and Willoughby Wood, Nottinghamshire; Graham, Yardley; Woodward, Breedon's Norton; Stratton, Broad Hinton; Josh. Robinson, Clifton-pastures; Spencer, Nuneaton; Oliver, Towcester; Morris, Aylesbury; Evans, Green, Ball, Baldwin, James, Lane, Lythall, Worsey, and a large number of the neighbouring agriculturists. The agents and representatives of the following noblemen and gentlemen were also present:—Mr. Drewry, for Duke of Devonshire; Mr. Moore, for Lord Radnor; the agent of the Duke of Sutherland; Mr. Savidge, for Mr. Langston, M.P.; Mr. H. Humphreys, for Mr. Herrick, of Beau Manor Park; Mr. Uzzleby, for Lord Dartmouth; the agent of Mr. Bramston, M.P.; Mr. Hendrick, for Mr. Strickland, Oxon, &c., &c.

Sweetheart, white, calved April 10, 1847; by Acccordion (5708), dam (Charmer) by Little John (4232).—Sold to Mr. Noakes, Kent, 26 guineas.

Young Frill, roan, calved in September, 1848; by Broughton Hero (6811), dam (Frill) by Rockingham (2550).—Mr. Bland, Lincolnshire, 35 gs.

Charmer 2nd, roan, calved January 26, 1850; by White Friar (9327), dam (Charmer) by Little John (4232).—Mr. Noakes, Kent, 74 gs.

Charmer 3rd, red roan, calved November 26, 1851; by Earl of Dublin (10178), dam (Charmer) by Little John (4232).—Mr. Pawlett, Bedfordshire, 92 gs.

Sweetheart 2nd, white, calved December 27, 1851; by Earl of Dublin (10178), dam (Sweetheart) by Accordion (5708).—Mr. Robinson, Clifton, 70 gs.

Sweetheart 3rd, white, calved December 10, 1853; by Daybreak (11338), dam (Sweetheart) by Accordion (5708).—Mr. Tracey, Kent, 91 gs.

Charmer 5th, roan, calved Dec. 31, 1853; by Garrick (11506), dam (Charmer 3rd) by Earl of Dublin (10178).—Mr. Hales, Kent, 60 gs.

Queen Anne, roan, calved July 11, 1854; by Baron Warlaby (7813), dam (Queen Victoria) by Lambton (9273).—Mr. Oliver, Northamptonshire, 55 gs.

Sweetheart 4th, roan, calved November 3, 1854; by Cardinal (11246), dam (Sweetheart) by Accordion (5708).—Mr. Allen, Longcrofts Hall, 60 gs.

Charmer 6th, roan, calved November 24, 1854; by Cardinal (11246), dam (Charmer 2nd) by White Friar (9827).—Mr. Pawlett, Bedfordshire, 160 gs.

Coral, red, calved January 24, 1855; by Cardinal (11246), dam (Charmer 3rd) by Earl of Dublin (10178).—Duke of Devonshire, 105 gs.

Welfare, roan, calved in March, 1855; by Baron Warlaby (7813), dam (Welcome) by Sugar Plum (10894).—Mr. Noakes, Kent, 85 gs.

Fringe, white, calved Nov. 10, 1855; by Londonderry (13169), dam (Young Frill) by Broughton Hero (6811).—Mr. Hales, Kent, 58 gs.

Sunflower, roan, calved Feb. 1, 1856; by Mameluke (13289), dam (Sweetheart 3rd) by Daybreak (11338).—C. Howard, Biddenham, 60 gs.

Romp, light roan, calved March 15, 1856; by Londonderry (13169), dam (Rarity) by Daylight (11339).—Mr. Oliver, Northamptonshire, 63 gs.

Nell, roan, calved April 30, 1856; by Lord Hardinge (13193), dam (Nellie) by Revolution (10718).—Mr. Evans, 27 gs.

Frontlet, roan, calved Jan. 10, 1857; by Londonderry (13169), dam (Young Frill) by Broughton Hero (6811).—Capt. Barclay, 89 gs.

Sylph, roan, calved March 1, 1857; by Londonderry (13169), dam (Sweetheart 4th) by Cardinal (11246).—C. Howard, Biddenham, 70 gs.

Charity, red, calved March 19, 1857; by Londonderry (13169), dam (Charmer 4th) by Earl of Dublin (10178).—Mr. Corbet, 22 gs.

Strawberry, roan, calved March 23, 1857; by Londonderry (13169), dam (Sweetheart) by Accordion (5708).—Lord Dartmouth, 67 gs.

Sunset, red roan, calved Dec. 10, 1857; by Mameluke (13289), dam (Sweetheart 3rd) by Daybreak (11338).—Mr. Mackintosh, Essex, 70 gs.

Flounce, roan, calved Dec. 20, 1857; by Londonderry (13169), dam (Young Frill) by Broughton Hero (6811).—Lord Dartmouth, 105 gs.

Columbine, roan, calved December 30, 1857; by Londonderry (13169), dam (Charmer 2nd) by White Friar (9827).—Mr. Green, 43 gs.

Coquette, red, calved January 15, 1858; by Mameluke (13289), dam (Charmer 5th) by Garrick (11506).—Mr. Bland, Lincolnshire, 65 gs.

Peeress, red and white, calved February 2, 1858; by Lord Hardinge (13193), dam (Playfellow) by Gustavus the Hero (7058).—Mr. Evans, 23 gs.

Wanderer, red, calved February 14, 1858; by Kirklevington 4th (14775), dam (Welcombe) by Sugar Plum (10894).—Mr. Longland, Northamptonshire, 17 gs.

Festoon, white, calved Sept. 23, 1858; by Kirklevington 4th (14775), dam (Fringe) by Londonderry (13169).—Mr. Oliver, Northamptonshire, 77 gs.

Cordelia, red, calved November 20, 1853; by Mameluke (13289), dam (Charmer 2nd) by White Friar (9827).—Mr. Langston, M P., 63 gs.

Sincerity, roan, calved Nov. 29, 1858; by Mameluke (13289), dam (Sweetheart 4th) by Cardinal (11246).—Mr. Oliver, Northamptonshire, 53 gs.

Cornelian, red, calved February 1, 1859; by Mameluke (13289), dam (Coral) by Cardinal (11246).—Mr. Langston, M.P., 86 gs.

Wanton, red, calved February 3, 1859; by Mameluke (13289), dam (Welcome) by Sugar Plum (10894).—Mr. Wells, Kent, 40 gs.

Serenitude, roan, calved Feb. 10, 1859; by Mameluke (13289), dam (Sweetheart) by Accordion (5708).—Mr. Graham, Yardley, 75 gs.

Quality, red, calved March 24, 1859; by Mameluke (13289), dam (Queen Anne) by Baron Warlaby (7813).—Mr. Wells, Kent, 85 gs.

Simplicity, roan, calved Nov. 4, 1859; by Mameluke (13289), dam (Sweetheart 4th) by Cardinal (11246).—Not offered.

Wellborn, red, calved Nov. 8, 1859; by Mameluke (13289), dam (Welfare) by Baron Warlaby (7813).—Not offered.

Starlight, roan, calved November 20, 1859; by Chivalry (14272), dam (Sunflower) by Mameluke (13289).—Mr. Tracey, Kent, 43 gs.

Sunrise, roan, calved November 21, 1859; by Mameluke (13289), dam (Sweetheart 3rd) by Daybreak (11338).—Mr. Ayres, Girtford, 42 gs.

Charming, red, calved January 11, 1860; by Mameluke (13289), dam (Charmer 6th) by Cardinal (11246).—Mr. Ayres, Girtford, 50 gs.

Sweetbrier, roan, calved Jan. 27, 1860; by Mameluke (13289), dam (Sweetheart) by Accordion (5708).—Mr. Ayres, Girtford, 50 gs.

The cows and heifers were served chiefly by Londonderry (13169) and Mameluke (13289).

BULLS.

Londonderry (16169), roan, calved October 18, 1853; by Earl of Dublin (10178), dam (Candytuft) by Janizary (8175).—Sir T. Lennard, 40 gs.

Mameluke (13289), red, calved April 9, 1854; by Janizary (8175), dam (Fillet) by Fawsley (6004).—Mr. Worsey, 48 gs.

Woodpecker (17248), roan, calved Sept. 27, 1858; by Kirklevington 4th (14775), dam (Welfare) by Baron Warlaby (7813).—Mr. Ball, 30 gs.

Sonnambulist (17015), roan, calved Oct. 24, 1858; by Mameluke (13289), dam (Sweetheart 2nd) by Earl of Dublin (10178).—Mr. Green, 75 gs.

Combatant (15788), roan, calved Nov. 11, 1858; by Mameluke (13289), dam (Charmer 3rd) by Earl of Dublin (10178).—Mr. Evans, 60 gs.

Comedian (15789), roan, calved Nov. 22, 1858; by Mameluke (3289), dam (Charmer 5th) by Garrick (11506).—Mr. Bramston, M.P., 105 gs.

Snnbeam (17059), roan, calved Dec. 14, 1858; by Mameluke (13289), dam (Sweetheart 3rd) by Daybreak (11338).—Mr. Baldwin, 66 gs.

Coxcomb, roan, calved Feb. 1, 1859; by Mameluke (13289), dam (Charmer 6th) by Cardinal (11246).—Capt. Barclay, 80 gs.

Freeholder, white, calved November 4, 1859; by Amiens (14095), dam (Frontlet) by Londonderry (13169).—Mr. W. Strickland, Oxon, 13 gs.

Challenger; red, calved Nov. 10, 1859; by Mameluke (13289), dam (Charmer 3rd) by Earl of Dublin (10178).—Mr. James, 27 gs.

Comical, red and white, calved Nov. 11, 1859; by Mameluke (13289), dam (Charmer 5th) by Garrick (11506).—Lord Willoughby de Brooke, 28 gs.

Sylvan, red, calved November 20, 1859; by Amiens (14095), dam (Sylph) by Londonderry (13169).—Duke of Sutherland, 27 gs.

Freedom, roan, calved Dec. 24, 1859; by Mameluke (13289), dam (Young Frill) by Broughton Hero (6811).—Mr. Bland, 23 gs.

Friendship, roan, calved Jan. 24, 1860; by Mameluke (13289), dam (Fringe) by Londonderry (13169).—Mr. Lane, 29 gs.

	£	s.	d.	£	s.	d.
Average price of 27 cows and heifers.	68	15	10			
Average price of 10 yearling heifers and calves	61	12	8			
Or average of the 37 females				66	17	2
Average of two old bulls	46	4	0			
Average of 12 yearling bulls or bull calves..........................	49	5	3			
Or average of the 14 bulls				48	15	9
Gross amount of the sale	3,157	7	0			
Average of the 51 lots				61	18	2

OUR PRESENT BREED OF HORSES.—I am of opinion that the breed of horses has much improved of late years. Only look at the two-year-olds of last year, their size and substance; also look at the horses now seen at the covert side and those of twenty-five years ago. In those days there were few good horses in the field, but now almost all have size and breeding. Admiral Rous states in one of his letters that the Queen's Plates seldom produce a race, and that owners of horses will not run a good horse for the paltry sum of 100 guineas. Now, I would suggest to Lord Redesdale, if he wished to improve or keep the breed of horses to the present standard, to obtain the money now given for Queen's Plates to be laid out in the purchase of thorough-bred stallions of size, power, and substance, and place them during the season in each county, charging 1 sov. and 2s. 6d. the groom for each mare. No farmer would object to pay that sum, and the amount would go some way towards the expenses of the horse's travelling. I do not suppose there would be money enough from the Queen's Plates to carry out this plan in one year, but in three or four years I have no doubt there would be sufficient to have two stallions in each county. This is only a crude idea, but I am quite sure, upon mature deliberation, such a plan could be carried out.—A FOXHUNTER in *Bell's Life in London.*

SANDCRACKS IN HORSES.—The following recipe for sandcracks I have used for many years with uniform success: Common tar, honey, elder ointment (equal portions), to be rubbed in between the hair and the hoof, twice a week, or oftener if necessary.—*London Field.*

PRINCIPLES OF MANURING.

LAWES' AND LIEBIG'S CONTROVERSY ON THE PRINCIPLES OF MANURING POPULARLY EXPLAINED.— THE ROTHAMSTED EXPERIMENTS WITH SPECIAL MANURES DESCRIBED. — UNMANURED AND MANURED CORN-GROWING PRELIMINARILY CONSIDERED.

As a means of illustrating both the principles and practical bearings of this celebrated controversy, it is impossible to select a more apposite, instructive, or important instance than that presented by the well-known agricultural triumph in successive and unmanured wheat-growing achieved by the Rev. Samuel Smith, at Lois Weedon. The manner of his yearly cultivation is as follows: At the usual time in autumn, the seed is drilled in strips, which (consisting, as each set does, of three rows ten inches apart) occupy thirty inches in width, and between strip and strip there is left an unseeded space of similar dimensions. During the growth of the plants in the ensuing season, the rows receive sedulous attention in hand-hoeing; while, at the same time, the interspace between strip and strip undergoes a constant succession of horse-hoeing and other fallow operations. Next year these fallowed spaces bear the strips, and the stubble of the preceding year's crop is ploughed up and summer-fallowed in like manner. In one point of view, there is a perfect analogy between this expedient and a practice not uncommon on the heavy land of Essex, in which is pursued field by field the simple alternation of corn one year and bare fallow the next, to be again succeeded by corn, and so on for ever; but in various circumstances of detail, into which we shall not here enter, the Lois Weedon method possesses a superiority very favourable to both healthy and prolific cereal productiveness. Mr. Smith's experience in this mode of management dates back to the year 1846. The area of his operations is comparatively small, being only five acres. The soil is above average quality, and consists of a staple of good wheat land, resting on wholesome clay, and naturally dry. The implement used for inverting the soil is the spade, or fork, in place of the plough. The average yearly produce for twelve years, ending with crop 1859, has been upwards of thirty-six bushels per acre of prime marketable corn; and the expenses of tillage, rent, &c., are as follows:—

TABLE I.

	£	s.	d.
Digging and cleaning	1	14	0
Horse-hoeing, three times	0	6	0
Ploughing	0	4	0
Hoeing and hand-weeding	0	5	0
Three rollings with crushers at seed-time and at spring	0	3	0
Two pecks of seed	0	2	6
Dibbling	0	5	0
Bird-keeping	0	4	0
Earthing-up wheat	0	3	0
Reaping, &c., thrashing, and marketing	1	13	0
Rent £2, rates and taxes 4s. 3d.	2	4	3
Total yearly expenses	£ 7	3	9
Value of thirty-six bushels of wheat at an average price of 6s. 6d. per bushel	£11	14	0
Deduct expenses as above	7	3	9
Annual profit per acre besides the value of the straw	£4	10	3

One other element of Mr. Smith's practice still remains to be stated (and on account of its paramount importance it has been reserved for special notice), namely this, that in each summer fallowing of the interspaces a method of deep cultivation is pursued, by which the upper and under strata of the staple are stirred, and inverted to the depth of ten or eleven inches; and if it be asked upon what grounds was this trenchant and very thorough tillage resorted to, the reply is, because theory and practice alike assured the experimentalist—1st, that usually in the soil, and ever in the air, there is an abundance of nutriment for cereal crops, in proportion as the mineral and atmospheric elements are brought into mutual reaction within the pores of the soil, by perfect cultivation; and hence, 2ndly, that by means of perfect tillage, the aid of adventitious fertilizing substances is not indispensable to the profitable growth of corn.

In point of agricultural importance, no industrial circumstance belonging to the present century is more entitled to deep consideration, than this brilliant, yet sound instance of tentative husbandry; nevertheless, in order to appreciate its true practical value, it is necessary to bear in mind, that as respects the happy combination of operative details of which it is made up, it consists of no principle or expedient in cultivation which had not been known and practised before. As an example of cereal productiveness, procured without the intervention of cattle crops, what other unalternate system than this prevailed in England, when, prior to the introduction of roots and clover in rotation, she not only fed her own population with corn, but exported it largely to foreign parts? Nay, more—what other than this, is the still existing policy in the cereal countries of continental Europe, which now so largely provide England with breadstuffs. As for the *interculture* of the Lois Weedon method, admirable and efficient as the expedient is, it can be regarded simply as an adaptation to corn tillage of that method of drill husbandry hitherto confined in general practice to the fallow crops only; while finally, the deep working, if not so generally prevalent as it ought to be, has long existed in many of the best-farmed districts of the island.

Now, the moral we wish to point out, in the foregoing statement, is this—that, from the case where, under sunny skies, and on a rich soil, the lazy husbandman has only to scratch a little covering of earth over his corn seed to produce an abundant crop, up to the elaborate processes of Lois Weedon experience, there is every variety and degree of evidence to show that wheat or any other kind of grain can profitably be raised by the power of tillage alone, and that the use of manures, whether obtained from the cattle crops of modern rotation husbandry, or from external resources, is not indispensably necessary to profitable cereal husbandry. Nay, more—from the practice of all nations it is deducible, that in proportion (within certain bounds) to the greater depth to which a soil is stirred, and to the perfect annual tillage it receives, the produce of that soil will be more abundant.

From these inculcations of unmanured and purely tillage husbandry, we now turn to the doctrines of a very different school, namely, those taught by the well-known authors of the Rothamsted experiments in agricultural practice, and in proceeding first to describe these experiments themselves, it must be explained at the outset, that in point of quality, the soil on which they were conducted is a medium clay loam, more suitable for wheat than turnip or barley husbandry. It rests on a deep red clay subsoil, which again reposes on a porous chalk, producing adequate natural drainage. The species of crops experimented on, embraced all the usual members of rotation husbandry; but the following observations shall be confined to wheat and barley, beginning with the trials with wheat.

Throughout the entire series of experiments, the object in view was to determine the relative fertilizing properties of various special manures used separately; and in order to free the experimental results from any residual effects of prior management, a field was selected which had previously undergone a succession of unmanured crops calculated to reduce it to its natural power of vegetative production. With regard to the substances put in trial, they consisted, in one set of the experiments, of alkaline salts and superphosphate of lime, intermixed, but destitute of any nitrogenous element; in another experimental series, nitrogenous salts only were used; whilst a third admixture consisted of alkalies, superphosphate of lime, and nitrogenous salts, all in combination. Previous to beginning the trials, the field was divided into plots, each appropriated to a separate manurial treatment; and, in order to form by the quantum of its produce a common standard of comparison, one of the subdivisions was cultivated and cropped year after year without manure of any kind.

All the plots received the same treatment in point of tillage; but what the particulars of this important department were, unfortunately is not reported. It is understood, however, that the seed was deposited in drills at eight inches apart, and that a series of operations was yearly performed to keep the land clean from weeds. The procedure began with crop 1845, and terminated with that of 1856. A fair selection from the multitudinous results recorded by the experimentalists in the course of this long period is given in abstract, in the following table:

TABLE II.

Experiments.	Number of years embraced in the experiments.	Average yearly manured produce.	Average yearly unmanured produce in the same years.	Increase of manured over unmanured produce.
		B. P.	B. P.	B. P.
1. Average produce of the continuously unmanured plot, cropped year after year without intermission	13	—	16.1	—
2. Average produce of various plots dressed with alkalies and superphosphate of lime	4	18.2	16.2	12.0
3. Average produce of various plots dressed with nitrogenous salts alone	6	28.1	18.0	10.1
4. Average produce of various plots dressed with alkalies, superphosphate of lime, and nitrogenous salts	6	30.1	18.0	12.1

Now, based on the data thus obtained, the experimenters have in effect asserted the following propositions:

1. That to corn plants, and all other members of the botanic order of grasses, is given the characteristic function of withdrawing from the soil a maximum amount of nitrogenous aliment—not, however, for the purpose of assimilating it in their tissues in excess, but to be used temporarily in carrying on their general assimilative processes, and then, in a gaseous form, to be expelled as waste matter into the atmosphere.

2. It is asserted by the experimentalists that the general industrial circumstances of English farming are such as to preclude the profitable growth of corn without greater or less aid from nitrogenous manuring of some kind. Now, without seeking to go into any circumstantial disproof of this proposition, we are content to place experiment against experiment, and, as an irrefragable evidence to the contrary, to rely on the Rev. Mr. Smith's unmanurial but eminently remunerative experience at Lois Weedon; supported, as it is, both in abstract principle and industrial practice, by the successful corn husbandry of this country prior to the introduction of the rotation system.

Again, 3. It is asserted by the experimentalists (and the proposition cannot be too earnestly considered) that the root and clover members of field culture are in their nature twice blessed; since not only are they means of increasing the provender of the farm for the use of the live stock, but in the processes of their growth they assimilate and garner up in their tissues a large amount of nitrogenous element, which in cattle court manure becomes a plentiful source from whence the excessive demands of the cereal crops may manurially be provided for.

Viewing these propositions as forming the basis of a mere hypothesis, it would be out of place here to occupy space in examining their foundation in physiological fact; but when the experimentalists, passing out of the province of scientific speculation, enter on that of the political economy of husbandry, by asserting,

4. That the use of cattle crops in rotation is essential to monetary profit in English tillage farming, we answer, first, by protesting against the results of a series of mere experiments (which, for aught known, may have been affected by circumstances of soil and climate not common to all districts of the kingdom) being exalted into catholic authority; and having taken this general exception, we shall proceed, secondly, to show not only the great improbability of the proposition, but moreover that the trials relied on disclose facts which not merely invalidate the conclusions derived from them by the experiments, but actually seem to confirm the doctrines of the opposite side of the controversy.

First, then, to prove the improbability of the conclusions respecting the financial benefits to the farmer of the much-vaunted expedient of cattle crops alternated with corn, we would, in the way of preliminary illustration, relate certain circumstances in actual husbandry obtained from instances occurring in proximity to Rothamsted.

Now, both from the experimental reports themselves, and more particularly from Caird's statistical work on English agriculture, it appears that the average acreable produce of the county (Herts) in wheat, barley, and oats, is no more than 22 bushels, 32 bushels, and 24 bushels respectively; and the yearly rental only 25s. per acre, tithe included. The prevailing rotation is a five-course of (1) turnips, or frequently a bare fallow, (2) barley, (3) clover, (4) wheat, (5) oats. In point of quality, the Rothamsted soil is part and parcel of that to which these particulars apply.

Now in the same district lies the property of Lawrence-end, belonging to Mr. Oakley, who, at the time Caird published his volume, farmed 800 of his own acres; of these 140 were in permanent grass, and 660 under the plough, on a four-course rotation of (1) turnips, (2) barley, (3) clover, (4) wheat. Originally the condition of the farm must have been low indeed; for, while at the time Caird visited it, the yield of wheat was 35 bushels, and of barley 40 bushels per acre, so recently as seven years before, it was scarcely more than half these quantities. Little is said in Mr. Caird's account of this farm respecting the tillage operations, although doubtless they were of the most efficient kinds; but as to the means employed adventitiously to enrich the soil, it is related that £500 was expended annually in purchased manures, guano, and Lawes' superphosphate (p. 458). To the turnips, farm-yard dung and superphosphate were liberally applied, and a considerable proportion of the crop was consumed by sheep on the field. The clover was also chiefly depastured, and the portion mowed for hay dressed with 2 cwt. of guano or 14 bushels of ashes every year; and having reached this point of our statement, the following calculations will probably be thought instructive:—

TABLE III., showing—

1st. The comparative money value of the yearly returns of Corn in various instances of non-rotation husbandry on the one hand, and of the four-course system on the other.

2. The comparative produce of the two sets of instances, determined by chemical estimate.

HUSBANDRIES.	Money estimate for four years						Chemical estimate for four years.		
	Annual acreable produce of corn per bush.			Corn produce for four years converted into money.			Non-mineral matter in four years.	Mineral matter in four years.	Total chemical estimate in four years.
	Wheat.	Barley.	Oats.	£	s.	d	lbs.	lbs.	lbs.
1. NON-ROTATION HUSBANDRY.									
1. Old English system of three corn crops and a bare fallow (see "Burnett's Tillage, a Substitute for Manure," p. 30)........	23½	32	36	17	15	0	4476	110	4586
2. Tullian husbandry by the plough (*ib.* p. 152)................	24¾	—	—	32	5	0	5808	132	5940
3. „ „ spade (*ib.* 153)................	33½	—	—	43	9	0	7804	176	7980
4. Rothamsted unmanured plot (*ib.* 175)................	16¼	—	—	21	2	6	3756	84	3840
2. ROTATION HUSBANDRY.									
5. Average produce of England in 1850-51 (*ib.* 30)............	26	38	—	15	6	8	3504	84	3588
6. Laurence End farming..................................	35	40	—	18	7	6	4080	96	4176
7. Average of the county of Norfolk, 1858 (see Read's article in vol. xix. of the Royal Agricultural Society's "Journal," p. 265 ..	30¼	38½	—	16	12	8	3726	91	3817
8. Average of the mixed corn district of Essex, 1846 (see Baker's report, vol. v. Royal Agricultural Society's "Journal," p. 1)..	30	40	—	16	15	0	3788	92	3880
9. Example in Baker's edition of "Bayldon on Rents and Tillages"	32	40	—	17	8	0	3905	95	4000
10. Example in Morton's "Encyclopædia of Agriculture," 1856 (article "Capital," vol. i. p. 387)................	28	38	—	15	15	0	3569	87	3656

NOTE.—The wheat is converted at the rate of 6s. 6d., barley 3s. 6d., and oats 2s. 6d. per bush.

Now, although as a whole this table is submitted in illustration merely of the line of argument here pursued, yet it contains two instances which, placed in apposition, give rise to reflections of a very practical and important nature, namely, those of the unmanured experimental plot at Rothamsted, and of the high-farming management exhibited by Mr. Oakley. In the former instance we have seen that, without the aid of a particle of manure, nitrogenous or otherwise, and by means of only ordinary tillage, there was

	£	s.	d.
In each four years produced a value of corn per acre of........................	21	2	6
Whilst in the high-farmed rotation instance the quadrennial return, similarly calculated, was only....................	18	7	6
Difference in four years in favour of the unmanured plot..........	£2	15	0

These things being so, the question then arises wherein lies the advantage, either in a monetary or physiological point of view, of appropriating three-fourths of the farmer's capital, and one-half of his farm, to the cultivation of forage crops, and in the feeding of stock, in order to procure what at best is only of hypothetical value, namely, an excess of nitrogenous element to supply the excessive demand for that substance, alleged, but not proved, to be characteristic of the cereal members of rotation? If, indeed, homestead-cattle husbandry were in itself a remunerative branch of farm industry, the answer might be that a mutually reflective influence passed between the green crop and corn departments beneficial to both. But since it is undeniable that in a vast majority of instances throughout the kingdom the annual balance is greatly against stall-feeding, unless a large supposititious value be placed on the manure, it is impossible but to arrive at the conclusion that, however useful farm-yard dung once was, and still may be, in bringing neglected land into heart, and in consolidating the looseness of light, or reducing the over-tenacity of strong land, its use in the improved and thoroughly-tilled farm is open to very grave objection, both financial and physiological.

In our next paper the recital of the Rothamsted experiments will be resumed, in order to exhibit their bearings on the proposition long ago stated and still maintained by Liebig as a fundamental point on his side of the disputation—that nitrogenous substances can never be used as specific manures without the induction of a decrease of fertile power in the soil exactly proportioned to the primary gain attributable to their specific effect.

NOTES ON MEADOWS AND PASTURES.

BY JAMES BUCKMAN, F.G.S., F.L.S.,

PROFESSOR OF BOTANY AND GEOLOGY AT THE ROYAL AGRICULTURAL COLLEGE.

PART IV.

THE IRRIGATED MEADOW.

There is no subject connected with pasture-land of greater interest or importance than that of the irrigated meadow; and we, therefore, propose to devote this paper to its consideration.

Irrigation may be defined as the *directing* a flow of water, at *chosen intervals, through* a pasture; and we shall the more clearly understand this definition by a study of the following, with which it is so often confounded—namely, *flooding*, the *accidental* overflow of the waters of a stream upon a pasture.

Irrigation, then, is a controllable operation within the limits of its requirements, which may be briefly stated as follows:

1stly, A stream of water so disposed as to be *capable of conduction* over the pasture; and,

2ndly, A condition of soil and surface that will ensure an *equable and certain* flow of the water *through* the pasture.

Considerations, then, arising out of these requirements, would lead us to infer that the rivulets and tributaries to the larger streams, or rivers, afford the conditions most suitable for irrigation, as they are always on a higher level, and so afford the requisite amount of fall for conduction, whilst the broader rivers flow through the flat country, between, not over, steep banks, which soon overflow on a sudden accession of water or a swollen tide, and thus a flood occurs, which is without control as to its quantity of water, the time of its coming, or the period of its removal. Not always, indeed, is it capable of running back to the river, but must await the slow process of percolation through the substratum, if sufficiently porous; and, if not, it may possibly go off by evaporation.

Having, therefore, so far made clear our meaning of the subject of irrigation, we prefer to further illustrate the matter by a reference to the system as carried forward on the banks of the Churn, the longest tributary of our most important river Thames; and we choose this because the district north of Cirencester, in Gloucestershire, to Cricklade, in Wilts, southwards, offers one of the best, as it was one of the earliest, sites of irrigative labours.

The Churn takes its rise from the Cotteswold Hills, which run for miles north and south, from Warwickshire to Somersetshire; and, being composed of an upper stratum of porous stone in the oolitic rocks, resting on impervious lias clay, these hills offer a large collecting medium for the rainfall of the district, which gushes out at the juncture of the lias and oolite, in the shape of springs, some smaller ones, on the scarp sides of the hills, running along the vales of Gloucester and Worcester to the Severn; but, as the dip of the strata is from the N.W. to the S.E., or in the direction of the valley of the Thames, that river, consequently, receives the larger share of the Cotteswold watershed.

The present condition of this valley, then, is that of a winding flat, of greater or less width, between gently-sloping eminences on either side. This flat land is covered all over with silt and gravel, which has been deposited there by a former broader stream. The present stream, however, has cut its narrower passage, in a tortuous course, through these shifted materials. Here, then, the very porous nature of such river-flats, and the poor vegetation of the gravelly subsoils, under natural conditions, offer not only the best circumstances, but the best conditions, for carrying out irrigation; for the hill-stream is sufficiently rapid, from the amount of fall, to enable its water to be conducted over very wide tracts with great facility; and the amount of water, on account of the great extent of the porous strata above, is not only abundant, but tolerably equable, the usual flatness of the ground, as left by the wide, brawling stream of past ages, rendering it no difficult matter to conduct the water over large areas, whilst the porosity of the substratum offers just the conditions for its draining through the pastures.

Taking these circumstances into due consideration, it is no wonder, then, that in this district irrigation should become a general system, and more especially as the result of the process is to raise the value of land from an average of about 25s. to 100s. an acre as a rent-charge—a difference so great, that some important reasons must be at the bottom of them; and these we shall now consider, under the following heads:

1stly, The influence of water on grass herbage.

2ndly, The changes in the kinds of herbage plants under irrigation.

3rdly, The economic relations of irrigated meadows.

1. *The Influence of Water on Grass Herbage.*

There can be no doubt but that the action of water upon meadow depends upon a variety of circumstances, such as mechanical, chemical, and climatical effects—*mechanical*, from the power of disintegrating small rocky particles, as well as dissolving mineral matter in general, which the percolation of soft water through the soil in which the herbage grows effects; *chemical*, from the mineral matters in solution, which all running streams possess, to a greater or less extent, thereby materially adding to those manurial principles which the water has aided to dissolve, so that the removal of an annual crop of hay only creates a partial diminution of these, which are again restored as soon after haymaking as possible, in order to refresh the soil for a quick production of the "lattermath." The plan of operations in the ordering of the "drowning," as it is locally termed, is about as follows:

Beginning in November, the water is let on to the meadow, from time to time, until February.

The early grass is then eaten off by sheep and lambs, which are usually folded. When eaten to the "bone," water is again directed through the field for a few days; and it is then "aimed up" for the hay crop.

This taken, it is again treated with water, if there be a supply—which is not always the case in the summer—for the "lattermath."

That this method of water-action induces a decided *climatical* effect, can hardly be doubted; for, as the fluid is in constant motion through, and not over, the herbage, there is no sign of freezing, except in stagnant places, in the most severe weather; and so, while, all around, the grass may be one uniform brown tint, the part under irrigation is at such times of a lively green;

and, indeed, it keeps growing even in winter, while the water is acting upon it, whilst in summer the moisture, both above and below, cannot but exert a powerful influence on the growth of grasses.

2. *The changes in the Kinds of Herbage Plants under Irrigation*

Now naturally demand attention, as a most important object of inquiry; and, as an illustration of these, we offer the following tables—firstly, of the contents of a meadow which has only been a few years under the process; and in this are shown the proportionals of grasses: secondly, of the herbage mixed with the grasses before irrigation, and after two and four years of its action: and the third shows the difference which exists in different parts of a very old irrigated meadow, where, from its steep slopes, the water could not reach the higher ground, and so only the flat part can be acted upon by the water.

It should be remarked that both the meadows are on the banks of the river Churn, and with a subsoil of oolitic gravel; so that, although, from their geology, they are admirably adapted for irrigation, yet, without the process—as, indeed, their natural herbage plants will show—the land now so rich in yielding three crops in the year, and fetching the yearly rental of £5 an acre, could only be considered as a thin upland pasture in its properties, originally worth about 20s.

TABLE I., REPRESENTING THE CHANGES OF GRASSES UNDER IRRIGATION.

Botanical Names.	Trivial Names.	Proportionals.		
		Before Irrigation.	After 2 Yrs.' Irrigation.	After 4 Yrs.' Irrigation.
Alopecurus pratensis.	meadow foxtail-grass..	1	2	4
Poa pratensis	field meadow-grass....	2	3	4
„ trivialis	roughish meadow-grass	1	2	1
Briza media........	quaking grass........	2	..	..
Cynosurus cristatus..	dogstail-grass........	2	1	..
Aira cæspitosa......	hassock-grass........	1	..	..
Agrostis stolonifera..	marsh bent-grass	1	2	3
Dactylis glomerata ..	cocksfoot-grass	1	2	3
Avena flavescens....	yellow oat-grass......	2	3	3
„ pubescens....	soft oat-grass........	1	1	1
Hordeum pratense ..	meadow barley-grass ..	1	2	2
Lolium perenne	perennial ryegrass	2	4	6

This field has trebled in value in four years.

This table is copied from the "Natural History of British Meadow and Pasture Grasses,"* p. 11, and to it are appended the following remarks:—

"This table shows us that all the better grasses have increased, if we except the *Poa trivialis* and *Hordeum* pratense, in which cases there has been an increase in grasses not possessing the best character. Now, with respect to the first of these, it should be noted that though it increased rapidly up till the third year, it is now declining. This is explained on the supposition that the drainage of the irrigated part was at first imperfect, and the water was consequently left in a partially stagnant state: this is often the case with such meadows on their first formation; but ultimately the water-conduits become better managed, and they act more perfectly. And, again, these changes become more evident where there is a gravelly subsoil. Stiff clays, without a stratum of lighter matter, seldom succeed so well under irrigation."

Now, as three years have passed since the above was written, we are enabled to state that the change for the better is steadily progressing, and the *Poa trivialis*, and, what still more evidenced a want of local drainage, the *Aira cæspitosa*—the well-known tussac or bull-pate grass—are scarcely to be recognized in the field at all.

TABLE II., REPRESENTING THE CHANGES OF HERBS FOUND WITH THE GRASSES.

Botanical Names.	Trivial Names.	Proportionals.		
		Before Irrigation.	After 2 Yrs.' Irrigatn.	After 4 Yrs.' Irrigation.
Ranunculus acris.....	upright meadow crowfoot	1	3	1
„ bulbosus	bulbous crowfoot	3	1	...
Plantago lanceolata...	narrow-leaved plantain	3	1	1
„ media	broad-leaved plantain ..	3	...	...
Trifolium repens	Dutch clover	2	...	...
„ pratense ...	broad clover	1	2	2
Anthriscus vulgaris..	common beaked parsley	1	2	1

This table points out the important fact, that large and innutritious herbs in pasture are much destroyed by irrigation; and the previous one makes it clear that their places are supplied by the grasses. However, the beaked parsley, sometimes increases at first, and, though it soon gets less, it is not entirely eradicated without pulling. This should be done, as it takes up much room, and is of little use in itself. Docks, too—such as *Rumex crispus* (curled dock), *Rumex pratensis* (meadow dock), and *Tussilago petasites* (butter burr), often increase by irrigation; these, however, are soon destroyed, and if not allowed to seed, give but little trouble; and, indeed, at the present moment we are enabled to report that they exist only to a very slight extent.

TABLE III., REPRESENTING THE HERBAGE OF DIFFERENT PARTS OF AN OLD AND PARTIALLY IRRIGATED MEADOW.

Botanical Names.	Trivial Names.	In Irrigation.	Without Irrigation
Ranunculus bulbosus.	bulbous crowfoot		—
„ acris......	upright ditto	—	
„ ficaria ...	pilewort	—	
* Rumex obtusifolius.	blunt-leaved dock	—	
* „ crispus...	crisp-leaved ditto	—	
Plantago media	broad-leaved plantain ...		—
„ lanceolata ...	narrow ditto		—
Primula vulgaris......	primrose		—
*Anthriscus sylvestris	beaked parsley	—	
Poterium sanguisorba	false burnet...............		—
Trifolium pratense ...	common clover		—
Achilleæ millefolia ...	yellow		—
Centaurea scabiosa...	hardhead		—
„ nigra......	blackhead		—
Bellis perennis	daisy		—
Carex cæspitosa	sedge		—
Heath or "sour" grasses			—
Usual grasses of irrigated meadows—mostly best kinds .		—	

* These are weeds which may easily be eradicated.

These tables alone, if properly studied as to all their consequences, will be amply sufficient to show the great changes for the better which take place in meadows conveniently placed and adapted for irrigation; and with them therefore we may, for the present, dismiss the further discussion of the scientific relations of irrigation, reserving the consideration of their *economics* for our next paper.

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ROYAL DUBLIN SOCIETY.

SPRING CATTLE AND IMPLEMENT SHOW.

Although we had been duly advised by our Irish friends, that there would be no finer speculation this Easter than stuffing an extra carpet bag with hay, and bringing it across the Channel, we could find but few indications of "the fodder-famine" which has threatened to decimate the herds even in the rich grazing lands of Tipperary and Limerick, as we surveyed the long platoons of cattle in the Dublin Agricultural Hall. To use the eloquent words of the Lord-Lieutenant, "Although the hedges have no shoots, and the banks no primroses; although our gardens grow blacker instead of greener, and our asparagus refuses to swell, yet out come our Shorthorns and Kerries with more rounded proportions of form, and more silky glossiness of skin than ever; out comes, in unrivalled majesty and rotundity, Dr. M'Hale himself." There were 379 entries in the cattle, 88 in the sheep, and 56 in the pig classes, which was quite beyond the average number of previous years, and these, combined with, perhaps, the best show of implements ever brought together in Ireland, made up an excellent anniversary of the Society. Still the attendance on the first two days, the latter of which was very wet, showed a decided falling off, and there was comparatively little activity on the renowned bull mart. This must be attributed rather to the backwardness of the Spring than to any short-comings in the animals themselves, as the young bull class was quite up to its usual standard, and was thought by some to be beyond it. In nearly every Shorthorn class, Ireland won the prizes; but she met this year with very little competition at the hands of the great English and Scottish breeders. Mr. Ambler contented himself with his treble victory of '59. The Towneley Champion Herd kept its trump cards for Canterbury, and sent no descendants of Master Butterfly, Jasper, or The Squire, to follow in their footsteps; Athelstaneford brought out nothing of its own, to carry on the Lamp of Lothian flame; and Messrs. Eastwood, Spencer, Marjoribanks, and Turnbull divided the strangers' honours. Rosette met all comers the second time for *The Farmers' Gazette Cup*, but her wonted Irish luck deserted her, and she was most ungallantly shorn of her honours by the Westland champion, Dr. M'Hale. It was not, however, on the rivalry of these two that speculation so much concentrated itself, as on the issue of the County Meath and County Dublin rubber, which was to be played out in the three-year-old bull class, between "The Doctor" and Sir Colin. The baronet had struck his colours when they met in the two-year-old class on the same spot last year, but matters had been changed at Dundalk, where "The Doctor" was sadly out of bloom. Long and hot had been the discussions between their partizans for eight months past; even the press had rushed to arms on the knotty point, and not a little money was depending on the judicial "aye" or "no" of the Dublin Shorthorn bench.

Still, despite this momentous question between their roan and white seniors, the yearling bull class held its old rank with the public, as "The Ireland's Eye" of the entire show-yard. Nearly all the 120 candidates came to their stalls, and sixteen of them were pulled out for further examination, after the first general survey. Mr. Jonathan Richardson's Soubadar, the No. 1 of the catalogue, kept his place without any difficulty, and the Marquis of Waterford offered 180 guineas for him, as soon as the fiat was known. His owner, however, held out manfully for 200 guineas, and the veteran breeder Mr. Coppinger, of Co. Cork, clenched the bargain for that sum next day. He is by Prince of Warlaby (whom Mr. Richardson is at present using) from a Baron Warlaby cow, and so back through a Hamlet cow, to the Marquis of Chandos, whom that "Old Parr" of English Shorthorns, Mr. Samuel Wiley, sold into Ireland. In point of age, he had a considerable pull over the second and third; but his great size, fine coat, and capital loin carried him triumphantly through. The judges not only awarded him the Ganly Cup as the second-best bull in the yard, but it was said that one of them rather preferred him to Dr. M'Hale. The second prize went to Mr. Crosbie's bull, a grandson of Mr. Douglas's Lamp of Lothian. He had fed as level as a sheep, and had Soubadar, who was some eleven weeks older, been out of the way, few would have grudged him the premiership. Mr. Richardson also gained third honours with his Knight of Lagan by Prince of Warlaby, a May calf of very great promise, and nice form and character, tracing back to Rose de Meaux, by Collard (3419); and Mr. Stratton, who was one of the judges, showed his appreciation of him, by taking him back to Broadhinton for 110 guineas. The "reserved fourth" place fell to the lot of Leviathan, a son of Sir Edmund Lyons, and lately sold by Mr. Fawkes to Mr. Roe for 200 guineas; but although he was a good robust-looking bull, there seems a probability that, true to his name, he may become rather too big. The other High Commendations were awarded to Mr. Chaloner's Shamrock, a neat son of Sir Samuel, with a fine loin and back; Mr. Marjoribanks's Young Mogul by Great Mogul, whose compact form and rich quality made him a very worthy champion for England; and Mr. Owen's Sir Hercules by a son of Baron of Southwick. Two were also commended, to wit, Mr. Wood's Nobleman, an animal of good form, but perhaps not a very nice handler at present, while Scotland had a mention with Messrs. Turnbull's Bottom.

The entries in the two-year-old class numbered 44, and of these 12 were "pulled out." Ireland won all the three prizes, and the only high commendation was awarded to Mr. Willis's Royal Alfred, from the neighbourhood of Bedale. Clydesdale—an own brother to Sir Colin, and his superior in the opinion of the majority—won the first prize for Lord Talbot de Malahide, with Mr. Lindsay's Mystery and Mr. Prentice's Sir Colin in order behind him. Clydesdale is a rich roan, and a grand bull, with valuable grazing points all over. He was bred by Mr. Pratt Tynte, of Tynte Park, and is by Mr. Barnes's Emperor, from Corn Cup by Vanguard—a purchase from Mr. Torr, of Aylesby. Eighteen entered the three-year-old lists with Sir Colin and Dr. M'Hale; two of them, belonging to Colonel Leslie, M.P., and Mr. Blackett, were highly commended, but the great roan and white rivals seemed to engross all attention. Perhaps never were two animals more distinct in their points and general style. Sir Colin was full of thick flesh; but there was a general roughness about him, especially in his forehand, which contrasted unfavourably with the level, elegant style of Dr. M'Hale. For a long bull, we have seldom seen anything so compact as the latter, especially behind the shoulders, and his beautiful outline was set off still more by the graceful style in which he moved when the judges had him on parade. His weakest point is a slight lightness in the flank and "second thigh"; but he can give these points away, and still find very few in England or Scotland fit to meet him in a show-yard. Some thought his chine and neck vein not very first-rate; but as the late Bill Cattell observed to a knot of Yorkshiremen, who were crabbing Monarch, "*any one of you gentlemen who's not satisfied with this bull, had better mak one for himself.*" Last season he served 60 cows, 26 of them from Mr. Barnes's own herd, and he has already nearly completed his Challenge Cup qualification allowance. He is by Mr. Booth's The Monk, from Mr. Barnes's Sylph, which won in the yearling heifer class some years ago, and has lately returned from a 15-guinea visit to Mr. Bolden's Third Grand Duke. Her old guardian, Tommy Fox —in the true Connaught costume of fifty years ago, viz., a long blue frieze coat, corduroy breeches, and blue stockings—was there to rejoice over her son's victory; while "The Doctor's" present guardian, "Gerty,"—clad in a fustian suit and apron to match, which reminded us of a spic-and-span stage blacksmith's—stood gallantly hour after hour at his favourite's head, amid a perfect bouquet of streamers and challenge-cup cards. "The Doctor" is, we believe, to quit Ireland shortly for Aylesby; British Prince, who has been there some time along with "The Monk," taking his place at Westland; but it is not yet settled whether he goes to Canterbury. Throughout the whole of the classes, the Warlaby blood (which has lately had a severe loss by the death of Nectarine Blossom) was most successful; and the aged bull prize was taken to England by Captain Spencer's Young Ben, a son of Booth's Benedict, and bred by Dr. Dickenson, of Ulverstone. He is rather more than four years old, with a nice head and a very good back, and especially fine quarters. Mr. Cruikshank's ancient favourite, Pro-Bono-Publico, who beat Grand Turk in this hall some years since, was second to him; and Donnybrook furnished a third in Mr. Roe's Sambo.

The females, taking them altogether, were not very first-rate; and seeing that the chance of selling heifers here is so small, there is no very great encouragement for breeders to send them. Mr. Crosbie's yearling winner by Golden Vein, a son of Lamp of Lothian, was exceedingly neat, and had a dangerous second in Mr. Marjoribanks's Diadem by Marmaduke, which was purchased for 40 gs. as a calf at the late Mr. Harvey Combe's sale. Captain Ball's Recherché by The Monk, and Mr. Reynell's Miss Molly by Puck, were highly commended, and helped to make up a nice quartet. Nancy Dawson did not come, and we heard that both she and the heifer-calf which she produced when she was only a year and eleven days old are both going on well, and that she gives eight quarts of milk a day. Starlight, the sire of it, stood just opposite her recent stall in the show; but as this love feat could not be taken into consideration, the tin number on his tail was his only badge of honourable distinction. This instance of early fecundity stands alone; but we know of another heifer which had a calf at fifteen months.

Scotland carried the day in the two-year-old heifer class with Lady of Bonhill, a long and low red heifer, of good form, though hardly equal in her handling to Mr. Christy's Limerick Lass the Second; but still the decision could not be carped at. There was only one high commendation in this class, which was by no means equal to the yearling heifer one. The aged cows showed in very small numbers, and the contest was entirely between Rosette and Sweetheart. The former had her second calf three weeks ago, and has thickened amazingly since Warwick. Her back is more wonderful than ever, but the effect of the development is to make her one weak point still more apparent. She has always been a great favourite in Ireland, and one Paddy exclaimed enthusiastically, as she was pitted at last against Dr. M'Hale for the *Farmers' Gazette* Cup—"*What a darling ye are, when I stand afore yer.*" Sweetheart, for whom Madame Caswell was a capital foil (and sent, we conclude, for that special purpose), looked very pretty; and it was said that she quite stole the affections of one of the judges, but we think that the universal voice fully ratified the decisions both in this class and every other. In fact, we hardly heard a dissentient voice among disinterested, and even interested lookers on.

The fat cattle were only a middling lot; and the Devons and Herefords had very few entries. There were two nice bulls among the former; and the dark chesnut Ayrshire bull Robin Adair had a host of admirers, as had the prize Alderney cow. Kerry made a good display of all ages and sizes, and principally black; and one of Mr. Cusack's bulls, Ned of the Hills, was one of the thickest and most perfect little mountain heroes that "the kingdom" ever sent forth. There were few nicer sights in the show than him and his companion Young Rodney as they stood side by side in their gay little sheets. One of the females had an udder which would not have disgraced a cow three times its size; and another calved in the show just after the judges had gone round. Among the freaks of the breeders was a cross between a Kerry and a Brahmin bull, which stood side by side with two pure Brahmins; the biggest of them rejoicing in a hump which Punch himself might have envied, but the best "nick" we saw was a miniature half-Devon half-Kerry ox bred by Mr. Garnett of Williamstown.

To the rivalry of Messrs. Owen and Thunder the Leicester part of the sheep show was not a little indebted, and they pretty nearly divided all the prizes in this class between them. Messrs. Hamilton and Broughton were pre-eminent in the Shropshire Down competition, and Mr. Beale Brown won, with his capital Cotswolds, the only four sections of long wools in which there was any competition. His pen of five ewe hoggets were especially admired. The pigs were middling as a whole, and among the best specimens were Mr. Joyce's pure-bred Berkshire boar, and the Hon. Francis Blackburne's white Windsor sow. For those so inclined, there was also a poultry show, in which the Spanish fowl hens—none of them very first-rate—seemed to predominate. The Dorkings were a good class, though we can hardly say the same for the Polish; and there was only one game cock quite to our mind. Rouen ducks and pigeons were fair, and geese very middling, but the prize pen of American turkeys atoned for all, and if the owner, Colonel Hill, had marked it at £20 instead of £7, no one would have been surprised. For perfection of form and beautifully burnished plumage, the cock could not be excelled, and many considered him quite worthy of being bracketted with Dr. Mc Hale, as the Castor and Pollux of the week.

A nicer show of implements were never brought together in Ireland, so simple and admirable in their style, and suited so exactly to the wants of the country. There was an air of lightness about the arrangement of them that contrasted favourably with the bewildering mass which meets the eye at the English Royal. With one exception, the arrangements on the whole were excellent; but even a wet day does not warrant the introduction of a large military band into the cattle department. We are not insinuating in the slightest that they played "the tune which the old cow died of;" their airs were orthodox enough, but the effect upon some of the two hundred bulls assembled was far from satisfactory, and if any of them had taken to fighting, and roused the others, there is no foreseeing the result. As it was, the vendors not only had a difficulty in conversing, but many of the bulls seemed so oddly affected by the sound, that they showed themselves to no advantage when they were led out for purchasers to examine. The Lord Lieutenant and his suite went round the show in the course of Wednesday afternoon, and falling back rather on his "Oxford First-class" recollections than those of the Castle Howard herd, his Excellency observed, in the course of his speech at the evening's meeting, that he could not look on Dr. Mc Hale "without being reminded of the snow-white herds of Clytumnus." Several interesting facts were adduced at the meeting to show the great advance which Ireland is making in the breeding of stock. In 1851 the value of this class of exports was only £474,000, whereas in 1858 it had risen to £1,053,000, while between the former year and 1859 the numbers carried on the Great Southern and Western Railway increased from 108,000 to 377,000. Since the census of 1841 no less than a million-and-a-half of waste acres have been reclaimed. Subjoined is a list of prizes and judges in the five principal departments.

LIST OF THE PRIZES.

JUDGES.

Shorthorns.—A. L. Maynard, Merton-le-Moor, Ripon; R. Stratton, Broad Hinton, Swindon; Thomas Norwood, Brackley, Northamptonshire.

Fat Stock.—Francis Wright, Sylvester Rait, Samuel Garnett.

Miscellaneous Breeds.—John Borthwick, Charles G. Grey, Thomas Ratcliffe.

Horses.—J. C. Naper, Major Burrows, J. O. G. Pollock, and J. J. Farrell, V. S.

Sheep.—Robert Wylie, Winter Hill, Catterick, Yorkshire; Augustus Warburton, Caleb Going.

Swine.—Joseph Woolf, Haslington Hall, Crewe; Major H. Stanley M'Clintock, J. Pratt Tynte.

CHALLENGE CUP.

The *Farmers' Gazette* Challenge Cup, awarded to Thomas Barnes, Westland, Moynalty, for short-horned bull, Dr. M'Hale.

The Irish Railway Challenge Cup, awarded to Thomas Barnes, for short-horned bull, Dr. M'Hale.

Ganly Challenge Cup, awarded to J. Richardson, Lisburn.

NEAT CATTLE.—BREEDING STOCK.

SHORT-HORNED BREED.

Bulls.—Best bull, calved in 1859, Jonathan Richardson Lisburn. Second best, W. T. Crosbie, Tralee. Third best J. Richardson, honorary certificate.

Best, calved in 1858, Lord Talbot de Malahide. Second best, Francis Lindsay, Killyleagh.

Best, calved in 1857, Thomas Barnes, Westland, Moynalty. Second best, Jaffray Barcroft, Kilbogget.

Best, calved prior to 1857, Captain Spencer, Whitehaven. Second best, Earl of Clancarty.

Best of all the prize bulls, Thomas Barnes, Moynalty, the Gold Medal. Second best, J. Richardson, Lisburn, large silver medal.

Heifers.—Best short-horned heifer, calved in 1859, W. T. Crosbie, Tralee. Second best, Stewart Marjoribanks, Watford.

Best heifer, calved in 1858, in calf, or producing a live calf within twelve months, subsequent to the date of the show, Messrs. Turnbull, Renton. Second best, John Christy, Adare.

Best, calved in 1857, giving milk, or in calf, Charles Landes, Ballylongford. Second best, Fitzwilliam Welsh, Limerick.

Best of all the prize breeding heifers, either having had a living calf, or producing a live calf within twelve months subsequent to the date of the show, Messrs. Turnbull, Renton, the Gold Medal.

Cows.—Best short-horned cow, of any age, either having had a living calf within twelve months preceding the date of the show, or producing a live calf within six months subsequent to same, Richard Eastwood, Burnley, Lancashire. Second best, Fitzwilliam Welsh, Limerick.

Best of the prize milch cows, Richard Eastwood, the Gold Medal.

DEVONS.

Bulls.—Best bull, calved in 1859, Sir A. E. Bellingham.

Best ditto, calved in 1858, Lord Charlemont, Clontarf.

Best bull calved in 1857, Lord Charlemont.

Cows.—Best cow of any age, either having had a living calf within twelve months preceding the date of the show, or producing a live calf within six months subsequent to the same, Charles Toole, Bray.

SCOTCH BREEDS.

West Highlands.

Best bull of any age, Lord Charlemont, large silver medal.

Best cow calved in 1857, giving milk or in calf, Lord Charlemont.

Scotch Polled.

Best bull of any age, Lord Talbot de Malahide, large silver medal.

Best ditto calved in 1858, producing a live calf within twelve months subsequent to the date of the show, Lord Talbot de Malahide, large silver medal.

Best cow of any age, having had a living calf within twelve months preceding the date of the show, or producing a live calf within eight months subsequent to same, Lord Talbot de Malahide, large silver medal.

Ayrshires.

Best bull of any age, H. Montgomery, L.L.D., Lisburn, large silver medal.

ALDERNEYS.

Best bull of any age, Henry Thompson, Dundrum, large silver medal.

Best heifer calved in 1859, Lord Charlemont, large silver medal.

Best heifer calved in 1858, having had a living calf, or producing a live calf within eight months subsequent to the date of the show, Duke of Leinster, Maynooth, large silver medal.

Best heifer calved in 1857, giving milk or in calf, J. W. Chapman, Maynooth, large silver medal.

Best cow of any age, having had a living calf within twelve months preceding the date of the show, or producing a live calf within eight months subsequent to same, Chas. Toole, Bray, large silver medal.

KERRYS.

Best bull of any age, Ralph S. Cusack, large silver medal.

Best heifer calved in 1859, Sir E. M'Donnell, large silver medal.

Best heifer calved in 1858, having had a living calf within twelve months previous to the date of the show, or producing a living calf within eight months subsequent to same, Sir Edward M'Donnell, large silver medal.

Best heifer calved in 1857, giving milk or in calf, Sir Edward M'Donnell, large silver medal.

Best cow of any age, having had a living calf within twelve months preceding the date of the show, or producing a living calf within eight months subsequent to same, W. S. Trench, large silver medal.

FAT STOCK.

Short - horned.

Best fat ox calved in 1857, Lord Clarina, large silver medal.

Best fat ox calved prior to 1857, Lord Clarina, large silver medal.

Herefords.

Best fat ox calved prior to 1857, R. W. Reynell, large silver medal.

Devons.

Best fat ox calved prior to 1857, Hugh M. Tuite, Mullingar, large silver medal.

Any other Breed or Cross-bred Animal.

Best fat ox calved in 1856 or 1857, William S. Garnett, Navan, large silver medal.

Best pair of fat oxen of any breed that have been fairly and *bona fide* worked as plough bullocks up to May, 1859, Nathaniel Barton, Straffan, large silver medal.

Second best, R. W. Reynell, small silver medal.

Best of all the prize fat oxen, Lord Clarina, honorary certificate.

Fat Cows, of any Age.

Best shorthorned cow, Francis Donagh, large silver medal. Second best, Ambrose Bole, small silver medal.

Best Devon, Earl of Shannon, large silver medal. Second best, Earl of Shannon, small silver medal.

Best Scotch polled, H. M. Tuite, large silver medal.

Best of all the prize fat cows, F. Donagh, honorary certificate.

Heifers.

Best shorthorned heifer, not exceeding four years of age, Earl of Mayo, large silver medal.

Best West Highland heifer, not exceeding four years of age, Allan Pollock, large silver medal.

Best Kerry heifer, of any age, J. O. G. Pollock, large silver medal. Second best, Lord de Freyne, small silver medal.

Best of all the prize fat heifers, Earl of Mayo, honorary certificate.

HORSES.

Best agricultural draught stallion, of any pure breed, foaled on or after the 1st January, 1853, John Mill, Corballis, Donabate (Lord Clyde); second best John Macken, Naul (Invader).

Best agricultural draught stallion, foaled since January 1, 1856, Sylvester Rait, Rathmoyle, Edenderry (Byron).

Best agricultural draught brood mare, in foal, or with a foal at her foot, John Mill (Nannie); second best, Loftus H. Bland, Q.C., M.P. (Black Bess).

Best agricultural draught colt, foaled since January 1, 1857, Nathaniel Barton, Straffan.

Best agricultural draught filly, foaled since January 1, 1857, James W. Chapman, Moygaddy Farm, Maynooth.

SHEEP.

Leicesters. — Best oneshear ram, John Taafe, three sovereigns.

Best twoshear ram, or ram of any other age, not exceeding four years, William Owen, Blessington, three sovereigns.

Best three hogget rams, never clipped, George Thunder, two sovereigns.

Best five ewes, with their lambs yeaned in 1860, or in lamb, William Owen, two sovereigns.

Best five ewe hoggets, never clipped, George Thunder, two sovereigns.

Long-woolled (not qualified to compete as Leicesters.) —Best oneshear ram, Thomas B. Brown, Andoversford, three sovereigns.

Best twoshear ram, or ram of any other age, not exceeding four years, Thomas B. Brown, Andoversford, three sovereigns.

Best three hogget rams, never clipped, Thomas B. Brown, Andoversford, two sovereigns.

Best five ewes, with their lambs yeaned in 1860, or in lamb, Alexander D. S. Deane (merit, no competition), two sovereigns.

Best five ewe hoggets, never clipped, Thomas B. Brown two sovereigns.

Shortwoolled (not qualified to compete as Southdowns). Best oneshear ram, C. W. Hamilton, two sovereigns.

Best twoshear ram, or ram of any other age, not exceeding four years, Lord Clermont, two sovereigns.

Best three hogget rams, never clipped, Peter Broughton, two sovereigns.

Best five ewes, with their lambs yeaned in 1860, or in lamb, C. W. Hamilton, two sovereigns.

Best five ewe hoggets, never clipped, C. W. Hamilton, two sovereigns.

Fat Wedders. — Best pen of five longwoolled fat wedders, not exceeding twoshear, Sir E. M'Donnel, large silver medal.

Best pen of five shortwoolled fat wedders, not exceeding four years, Peter Broughton, large silver medal.

Best pen of five Cheviot fat wedders, Lord Clermont, large silver medal.

PIGS.

Large Breeds.—Best boar, six months, and not exceeding twelve months old, William Joyce, three sovereigns. Second best, Lord Lurgan, two sovereigns.

Best boar, exceeding twelve and not exceeding twenty-four months old, Dr. Radcliffe, five sovereigns. Second best, Charles L. Ellison, three sovereigns.

Best boar, exceeding twenty-four months old, Lord Clermont, five sovereigns. Second best, Dr. Pentland, three sovereigns.

Best breeding sow, in pig, or having had a litter within six months, Lord Lurgan, three sovereigns. Second best, William Joyce, two sovereigns.

Best three breeding pigs of the same litter, under ten months old, Lord Clermont, three sovereigns. Second best, William Jameson, two sovereigns.

Best litter of pigs, not exceeding five months old, accompanied by the sow, William Joyce, three sovereigns. Second best, Dr. Eustace, two sovereigns.

Small Breeds.—Best boar, six months and not exceeding twelve months old, Lord Clermont, three sovereigns. Second best, John Wight, two sovereigns.

Best boar, exceeding twelve and not exceeding twenty-four months old, Right Hon. Francis Blackburne, five sovereigns. Second best, John Milford, three sovereigns.

Best breeding sow, in pig, or having had a litter within six months, Right Hon. F. Blackburne, three sovereigns. Second best, Jonathan Bruce, two sovereigns.

Best three breeding pigs, of the same litter, under ten months old, Duke of Leinster, three sovereigns. Second best, J. Richardson, two sovereigns.

Best litter of pigs, not exceeding five months old, accompanied by the sow, two sovereigns.

Best fat pig, of any age or breed, Robert D. Barry, large silver medal.

WHARFEDALE AGRICULTURAL SOCIETY.

This society, which is the oldest in Yorkshire, having been established prior to the year 1800, held its annual meeting on Friday, the 13th April, at Otley. From the fact of this being the earliest of the many agricultural meetings held in the West Riding during the season, considerable interest is always taken in the gathering. The attendance was numerous; and the entries in most of the classes showed an increase compared with former years.

JUDGES.

Cattle and Horses.—Mr. J. Unthank, Netherscales, Penrith; Mr. R. Emmerson, Eryholme, Darlington; Mr. J. M'Cole, Rowell, Kettering.

Pigs.—Mr. T. Dodds, Watkinson Hall, Halifax; Mr. T. B. Stead, Leeds.

The following is the award of prizes:

SHORTHORNED CATTLE.

Gentlemen's Premiums.

The whole of the prizes (six in number) in this class were awarded to Mr. F. H. Fawkes, Farnley Hall, Otley.

Farmers' Premiums.

Best one-year-old bull, J. R. Middlebrough, South Milford (for Stockwell).

Best two-year-old bull, T. Skirrow, Asquith, Otley (Emperor).

Best bull-calf, T. Jolly, Warlaby, Northallerton (Ajax).

Best one-year-old heifer, T. Jolly, Warlaby (Titania).

Best two-year-old heifer, T. Jolly, Warlaby (Leonora).

Best cow, J. R. Middlebrough, South Milford (Rosebud).

Best heifer-calf, A. Renton, Leathley (Moss Rose).

HORSES.

Best stallion for hunters, J. T. Fenton, Thorp Hall (Conqueror).

Best stallion for hackneys, J. England, Silsden (Young Merrylegs).

Best stallion for agricultural purposes, R. Elmsley, Claraton, Knaresborough (Lord of the Manor).

Best hackney brood mare, Miss Stott, Eccleshill Hall.

Best brood mare for agricultural purposes, T. Skirrow, Asquith, Otley.

PIGS.

Best boar (large breed), W. B. Wainman, Carhead, Cross Hills, Leeds.

Best sow (large breed), W. B. Wainman.

Best boar (small breed), W. Hatton, Addingham.

Best sow (small breed), W. B. Wainman.

PLOUGHING.

First prize, £3, J. Hullat, Bedford (Howard's plough).

Second, £2, J. Oddy, Baildon.

Third, £1, T. Shackleton, Weardley.

(23 competitors.)

Boys under 18 Years of Age.

First prize, £2, J. Casson, Batley.

Second, £1, J. Todd, Alwoodley.

Champion Prize, Gift of F. H. Fawkes, Esq.

First prize, £3, George King, Menston.

Second, £2, T. Papplewell, Esholt.

REVIEW.

HANDBOOK OF DAIRY HUSBANDRY.

By John Chalmers Morton, Editor of the "Agricultural Cyclopædia."

Longman and Co., 1860.

This work in the present low state o the corn market, is a most important one to the English farmer, who is casting about to see how he is to hold his land at a fair profit; or, it may be, without sustaining a considerable loss. If, indeed, there is any department of agricultural industry that is likely—we might say certain—to be remunerative if properly conducted, it is the dairy; and we cannot help expressing our surprise that with so large a proportion of grass-land as this country possesses, there should be a necessity for importing such an immense quantity of butter and cheese—namely, an average of upwards of 20,000 tons of each annually (22,400 tons butter and 19,300 tons cheese), whilst the price is still as regularly found to rise, proving that, with all this importation, the supply is not equal to the demand. Or this is so nicely balanced, that the dealers have it in their own hands and can charge what prices they please. And not only this, but a very large proportion of the foreign butter is so abominably adulterated with lard, oatmeal, gruel, and other equally cheap and profitable ingredients, that it is impossible to tell what you are purchasing. Any one who has been in the habit of using Ostend butter, for instance—and we Londoners can scarcely get any other *fresh* butter at this season of the year, the supply of home-made not being sufficient for one-fourth of the consumption—knows that in general it possesses none of the real flavour of butter, that it is insipid, soft, and rolls up on the bread, instead of spreading equally over the surface. It is, in fact, a composition; not unwholesome, it is true, but anything rather than genuine butter, while it is manufactured at a rate that yields a large profit. A very few years ago, this composition butter did not sell at retail higher than 9d. or 10d. per lb. But so largely has the consumption increased, owing to the improved condition of the operative classes, that it now fetches from 14d. to 15d. per lb., and is one of the most certain trades a person can enter into. As for Dorset, Devonshire, or Suffolk fresh butter, it cannot be purchased under 18d. per lb., as every housekeeper knows to her cost; and the quantity sent to market is not sufficient for one tenth of the consumption.

With regard to cheese, there is no deception it is true, but the consumption of it is equally increased with that of butter, and the price has proportionately advanced. A few years since, the finest and richest American cheese could be purchased at from 4d. to 5d. per lb. The price is now from 8d. to 9d. per lb., and the supply is by no means large enough to meet the demand; nor is the general importation of cheese so great as it was ten years ago, the quantity in 1848 being 441,635 cwts., whilst in 1858 it was only 364,087 cwts.

That a dairy farm must pay in situations where the stock can be kept to advantage, that is on dry pastures with a full supply of good water, there cannot be a doubt. Mr. Morton has given, in page 84 of his handbook, an estimate for a farm of 500 acres, of which 380 acres are in pasture laid out in convenient fields, and 120 acres af arable land, in twelve ten-acre fields. On this, 120 cows and 30 yearling and two-year heifer calves are kept, with adequate piggeries to consume profitably the skim milk, &c. The profit of this farm, reckoning the wheat produced at only 5s. per bushel, is shown to be £510 per annum, the capital employed being £4,780 which makes the return equal to 12 per cent., after deducting all expences, and reserve fund enough to meet the risks of so large a stock of cattle.

We recommend our readers to peruse this little volume, which will convince them of the advantages of a dairy over an arable farm. In the meantime we would ask, how it is that there is so increasing a dislike or indisposition with our farmers' wives and daughters to undertake the management of dairies? Is it because the present race are better educated and more enlightened than former ones, and that therefore they think it beneath them to attend to so vulgar an employment as a dairy? Certain it is that unless the farmer's wife and daughters do look after the dairy themselves, it is ten to one against its being properly conducted. But if these ladies think such an employment beneath them, we would advise them at once to procure "Our Farm of Four Acres," or Miss Martineau's "Farm of Two Acres," to be convinced that such an occupation, if properly attended to, is so far from being beneath a well-educated and highly talented woman, that it involves the development of scientific knowledge of the most abstruse kind. It is, too, not incompatible with literary and other elegant pursuits and refined tastes, and is equally conducive to the preservation of health and buoyancy of spirits, such as we regret to find some of our fair rural countrywomen are willing to sacrifice at the shrine of a pseudo gentility.

However, the subject has more important claims than these; and while the ladies are studying the agreeable little works we have just named, we recommend their husbands and brothers to become equally familiar with Mr. Morton's Handbook. They may back this with advantage by a perusal of a lecture recently delivered at Faringdon by Mr. Edward Little, of Landhill. His subject was "the Dairy Management of North Wilts," and the paper appears in the *Farmers' Magazine* for April.

STUDIES OF THE SOIL.

BY WILLIAM EDSON.

The two sciences, as such, geology and chemistry, from which must arise in a more or lest direct manner all theory in relation to the formation and treatment of soils, are but little understood among practical men, and are commonly treated by them as subjects entirely aloof from their duties; yet every intelligent working man, and especially the farmer, is both a chemist and a geologist, and depends, in a degree, for his success, upon his practical knowledge of these sciences.

Aside from the merely business view of this knowledge, there is another in which its value is greatly enhanced: I refer to its effect upon the mind of the recipient. We all live in two worlds, the world of mind and the world of matter. It is the lot of most to labour in one or both of these. Necessity requires us to labour in one, the world of matter, which is the labour of the hands. Manliness and Christianity urge us to labour in the other, which is the work of the mind. Life cannot be truly enjoyed independent of either health of mind or health of body, and as health of body depends directly upon bodily exercise, so health of mind depends directly upon mental exercise.

All agree that, in the duties of the intelligent farmer, the labours of the hand and brain are most harmoniously blended, and that it is for him to enjoy that rarest of all blessings, "a sound mind in a sound body."

The farmer, as he follows the plough, may not be wholly engrossed in mere manual labour—every clod that the plough turns up, will give him a lesson in geology, and every rootlet a lesson in botany; let him be ever so indifferent, nature will insist upon his learning some one of her many secrets; she will give him something to treasure up for his future use or pleasure. By this almost involuntary study has the farmer's storehouse of knowledge been filled: by it the rude chance-farming of the ancients has advanced to the present state of intelligence and certainty.

Until quite recently, the term "scientific farming" was not used, and we now hear it oftener as a term of reproach than otherwise; but it cannot be denied that science, even as put forth by the most impractical, has done the agriculturist great good, and is destined to do still more. Perhaps one of its greatest benefits, up to the present time, is that arising from the strong feeling of emulation among farmers of the old school, to prove by their crops and profits that they can excel the theorist; urged by this feeling, they have eagerly sought for improvements, and applied them with a skill which only the good old-fashioned farmer is capable of. It has also caused discussions, and excited a thirst for experiment and inquiry which cannot result otherwise than in good for all. These are only some of the incidental benefits arising from the application of science to agriculture; the true value of this department of scientific knowledge cannot be estimated, since much more is now known than has yet been generally and skilfully applied; and again, there is much of agricultural chemistry which is yet in so vague and uncertain a state as to be almost, if not quite worthless, as far as practical farming is concerned.

If it were true, as some have the hardihood to assert, that no practical good, as far as crops and profits are concerned, arises from scientific research in this department, yet its benefits upon the mind of the farmer would be incalculable, as it raises his thoughts to the contemplation of the laws of nature, giving him one of the most stable of all pleasures, and health of mind, the crown of "green old age."

Assuming that every farmer is both a practical chemist and geologist, since the most common duties of the farm require a knowledge of these sciences, I wish to call attention to the chemistry and geology of the surface stratification.

For the sake of simplicity in the treatment of the subject, I will divide the varieties of soil into three classes, namely, 1, mechanical; 2, chemical; 3, vegetable. This general classification may strike the geological reader as novel and perhaps inadequate; but for the ordinary discussions of practical men, I think it will be found not inappropriate, if we bear in mind that the terms used are not intended to indicate by what agency the materials of which the soils are composed were brought into their present positions, but simply to express the present condition of the soil itself. Thus, by mechanical, I would designate all earths which bear evidence of not having undergone any great chemical or vegetable change since being deposited in their present position—that is, the mixture of the different materials of which they are composed is simply a mechanical one; by chemical, all that indicate by their strata and composition that some important change in their qualities has taken place since their deposition; and by the last term, all that are principally made up of vegetable matter.

The first of these formations, or classes of formations, to which I give the name mechanical, may be found in nearly all positions, though perhaps oftener in low than high grounds. Under this head will be classed moraines, sand-hills, and bars, ancient river-beds, and all such surface strata as bear evidence of having been deposited by some violent mechanical action.

Upon examination of the strata of this class, we find them sometimes composed of regular layers of material, which is not always coarsely divided, but yet is never thoroughly, chemically united; others have no regular layers, but seem to be composed of confused masses of gravel, sand, and clay, which are not intimately united, nor in any manner definitely divided; here is a bed or layer of gravel—it extends a few feet, and abruptly terminates in a bed of clay, or perhaps gradually growing thinner and thinner, disappears between layers of clay and sand; again, we find strata of almost pure sand. I cannot enter into a lengthy explanation of the causes of these various phenomena, but will briefly state them; thus, when the layers are comparatively regular, they are supposed to have been deposited from running water, either fresh or salt. The irregular stratification, which in fact covers a large portion of the eastern part of Massachusetts, is undoubtedly owing to glacial action, as it occurs in ice-bearing currents, while the occurrence of sand-hills is generally assigned to the action of the wind.

The currents from which were deposited a large portion of the surface formations of the eastern part of New England, are supposed to be analogous to the oceanic currents of the present, and probably arose from the same causes, namely, evaporation, difference of temperature of the polar and equatorial regions, and the earth's rotary motion.

The currents of the ocean are, without doubt, constant, considered as a whole; in other words, there always exists a series of currents and counter currents, those from the poles moving south-westerly, and those from the equator north-easterly, of the northern hemisphere; for the southern hemisphere, the reverse is true. The existence of these currents is thus accounted for. The velocity of the surface of the earth at the equator is about one thousand miles per hour, towards the east: while at 45° north or south latitude, it is but seven hundred and fifty miles per hour; therefore, water at the equator has a velocity of one thousand miles per hour, and water at 45 degs. but seven hundred and fifty miles per hour; now, if, from any cause, a body of water moves from the equator towards the north, it will still retain its easterly motion of one thousand miles per hour, lessened only by friction; hence, when it arrives at 45 deg., where the surface motion of the earth is but seven hundred and fifty miles per hour, it will have an easterly motion exceeding in rapidity that of the earth's surface by two hundred and fifty miles per hour, if it were not reduced by friction; as it is, the excess is great; this excess of velocity being combined with the northerly direction gives the currents their north-easterly course. The same reasoning applied to currents flowing from the north pole to the equator, will show why all such have a south-westerly direction. The gulf stream is an example of the first, and the currents which bring down polar ice are examples of the last. Balloonists take advantage of this same principle, and found upon it their theories of easterly aërial currents, in which they think they may be able to cross the Atlantic. The effects of these currents are *abrasion* and *drift*.

The action of a current of water sweeping over the surface is, first, to remove all loose earth from high points and deposit it in valleys; but its effect does not end here, for no sooner is the loose earht removed than the solid rock is attacked, and in its turn carried down to the valleys. This mechanical action upon the rocks, together with the chemical decomposition that is constantly taking place, is called detrition; the resulting deposit is called drift.

Currents of air produce the same results as currents of water, and though the action of the wind is much less important, it is still so great as to be well worth careful consideration. The aqueous currents cease their action before the land becomes inhabited, but the aërial ones are always at work.

The effect of abrasion upon the surface is perfectly obvious; it can leave nothing but a barren and hard strata wherever it takes place. Though drift is but the counterpart of abrasion, its action is much more complicated and difficult to understand. Its effects are commonly just the opposite; for wherever drift accumulates, there we may be nearly sure of finding good land. In New England, wherever a soil is evidently composed of drift from an oceanic current, it is easy to state its chemical composition, as originally deposited; we have only to examine the exposed rocks lying in a direction north-easterly from it; their nature must of necessity determine the nature of the soil in question. It should be remembered, that, in the examination of soils, this is to be considered but as a general truth, and that there are so many modifying causes that this knowledge alone will not enable one to determine with any degree of accuracy the present chemical nature of the soil.

One of the most important considerations for the New England agriculturists, and one in which almost every farmer is directly interested, is that of river and lake deposits; these consist of not only large amounts of finely granulated mineral, but also vast quantities of vegetable matter. The extreme richness of such deposits must be acknowledged by every one who considers the following fact: first, the minerals of which they are composed are finely and intimately mixed; second, the finely divided minerals are not only carbonized, but are brought in connection with particles of carbon and decaying vegetable matter, or humus; and lastly, the entire mass is more or less impregnated with ammonia. Although it is impossible to conceive of a richer soil than this, yet it is probable that there is no class so universally neglected and despised. In scientific classification, soils formed of these deposits are called fluviatile and lacustrine; the farmer turns them off with the not very flattering title of swamp or mud hole.

As an example of the magnitude of these deposits, the following may be interesting. The area of the delta of the Mississippi is 13,600 square miles; the average depth of deposit is 528 feet, and it has been estimated that the river annually deposits thirty-seven hundred millions of cubic feet! This at first thought seems large; but even at this rate, the venerable father of rivers must have diligently laboured for sixty-seven thousand years.—New England Farmer.

THE AGRICULTURAL LABOURER, HIS COTTAGE, WAGES, AND ADVANTAGES.

BLANDFORD FARMERS' CLUB.

A meeting of the members of this club was recently held, Mr. R. Lewis, of Ash Farm, president for the year, in the chair, when Mr. Robert Fowler, of Whitchurch, read the following paper:—

I have to claim your attention this evening to the subject appointed for discussion, viz., "The Agricultural Labourer, his Cottage, his Wages, and Advantages;" and when I state, according to Mr. Morley, who has taken great trouble to get at the truth, the agricultural labourers are no less, "speaking in round numbers," than nine hundred and fifty thousand men, assisted by about four hundred thousand women and boys, representing with their families nearly five million souls, or about one-fifth of the population of this kingdom, I think you will agree with me, that it is an important subject, and one worthy of our consideration. I fear this number is rather decreasing than otherwise, and as they are the most useful class of all human beings, it behoves us to try to find out the cause of this decrease, if it is so, with a view to a remedy; for it is acknowledged on all hands that the need of their assistance is yearly increasing. I know during the last few years much has been done for their improvement. Still much more doubtless remains to be accomplished; and I trust our devoting this evening to the subject may be the means of furthering their improvement. I think, for instance, if we were to study their little wants more than we do, as a body, it may be the means of drawing them into a closer bond of union with us. If we prove to them by our actions, by our words, and by our manner, that we have their welfare, their interest, and their comfort at heart, I believe it would be the means of inducing them more to study our interest, and to give us their good will, as well as their time and labour. If we have a horse or cow taken ill, we immediately give it our especial care, watch over it, and provide it with whatever necessaries are required. I trust in these particulars our labourers do not fare worse than our stock. If our rich neighbours are ill, we immediately call on them, and enquire after them; I hope we all do the same with our neighbours the poor labourers, though I must confess I feel myself guilty of some neglect in this particular; I know I have not done so as often as I should, and this has been brought home to my mind more particularly by your giving me this subject for my consideration. Mr. Seymer mentioned at our last agricultural dinner that the labourers in this part of the country were not so good as in many others, and consequently were not deserving of such good pay. I am sorry to differ from so great an authority; but I must say I believe him to be under a wrong impression, for I consider as good and as well paid labourers are to be found in this county as in any other, and I feel proud of belonging to a class second to none in the regard we have for those who are born to earn their bread by the sweat of their brow. We know they are better educated, housed, and paid, than they were some years since, and that gradual improvement on the whole is still going on; and where such is not the case, I consider an immense responsibility rests on the shoulders of both the owners and occupiers of the soil, for on these two classes much of the moral and social position of the labourer depends—a class be it remembered on which rests the very existence of all others, and a very great portion of the comfort and happiness of mankind. We should be

> "To their faults somewhat blind,
> And to their wants ever kind."

I regret that more suitable employment for the females is not to be had in this neighbourhood. Many of us remember when button-making was a good source of income amongst the poor; four and even five shillings per week were frequently earned by the women at this employment, but it has now entirely disappeared; bone and pearl buttons are now used in the place of those cotton-worked ones, and unfortunately nothing else has taken its place. Hundreds of women have now little to do but tale bearing, chit chat, and tittle tattling; their children are taken very young to the infant schools, and farm labour is become somewhat distasteful to many of them. It has often occurred to me, if some glover, stocking-maker, or other manufacturer, requiring the employment of females, were to get up a business in this neighbourhood, what good might thus be done—anything in fact that would give the females constant employment, adding to their income, and making them more useful members of society. I will now pass on and call your attention to the education of our poor. And though now the most labourious work is done by the aid of steam, still it has been found that the demand for manual labour does not decrease, but we require it to be more skilled and experienced, for the labourer is at last the great weapon in our hands that has enabled us, by the assistance of steam and improved implements, to bring such large tracts of poor land into cultivation, producing golden treasures instead of remaining a barren waste. The labourer is the great producer of the wealth of a nation, and consequently deserving of as much care and respect as the possessor of it. An honest and industrious labourer, in my opinion, is much more deserving of respect than miserable gentility, priding itself with having nothing to do. Is not the busy bee that brings honey to the hive deserving more care than the drone that devours it? Still let due honour be given to those members of our upper classes who spend their time and wealth for the happiness, comfort, and education of the poor, and many such are to be found in this neighbourhood. I would wish that under all circumstances our labourers should receive the rudiments of education; their children should be so far educated as to be able to read so as to understand what they read, to write sufficiently to communicate with their friends, and also thoroughly to understand the four simple rules of arithmetic; and one thing in particular, which is too often neglected in our village schools, I would teach them freely to use soap and water, for cleanliness is next to godliness, and ignorance and filth the parents of crime and misery; girls also should be better trained for domestic servants, washing, baking, &c. Thus far I would educate them, using such means as may be found available in every parish, and at as little expense to them as possible; but something they should pay, however trifing it may be, for it too often happens that what costs nothing is but little valued, and a low estimate of education should be avoided. I think a small payment raises a little honest pride and feeling in a man of having done his best for his offspring. I hope the time is not far distant when all will be enabled to write their names. Do not suppose that I consider this sketch a sufficient education for a poor person, only that, further than his grounding, he should be left mostly to his own resources, lest we place him in a better position than the class who have, by their frugality and perseverance, raised themselves higher in the scale of society, which, in my humble opinion, is wrong, and would go far to remove that stimulus to exertion which is so commendable. I am pleased to be enabled to state that schools purposely erected for the poor are now to be found in nearly every parish, built by the munificence of the landowners, assisted by the clergy and tenantry. If any parish can be found without one, it is becoming the exception to a general rule; and none of us can judge of the results of even such an education as I have named, for it must not be forgotten that from the labouring classes have sprung many excellent and extraordinary men, bright examples of what may be done by perseverance and industry. I will mention, for instance, Watt, the inventor of the steam-engine, and Stephenson, to whom we are mostly indebted for our railways. Only consider for a moment the value of these combined. Why, they are beyond our calculation or imagination. Boys have of late years been kept longer from labour, for the purpose of education. We know a few years since, at about seven or eight years of age, they were expected to earn something. In the majority of cases, they are now kept at school until nine or ten years old, and I rejoice that it is so, for we all know, from daily experience in life, that the man is most useful who has learnt to value knowledge and the use of his brains as well as to exert his strong arm. The labour of the head of a workman is to us most valuable. I will now call your attention to the cottages of our labourers, which is the next portion of my subject, and sorry am I to say that, go where I will, I find much requiring attention under this head. Decent and respectable homes for our labourers are not so numerous as they should be, and this is the great cause of our constantly hearing of a want of young men. Do we not hear of a difficulty in filling the ranks of our army and navy? Is it not the case in most of our parishes? and can we not trace it to this great scarcity of cottages, driving young yeople from the place of their birth, either to emigrate or settle down in the worst of hovels in the back lanes of our towns? I believe few farms have as many cottages as are required for the proper residences of those working on the farm; and because owners of property fancy building cottages does not pay, this state of things is allowed to continue. I can quite agree with them, speaking of it as a matter of speculation, that building cottages to let for the sake of the rent, does not pay; but where is the farmer that will not pay an increased rental for a farm having cottages on it for the use of his labourers, when compared with one on which these requisites are not to be found, but which depends on chance for labourers to carry on his business? And then cottages should be built near the work of the occupant, that his time and labour be not lost and wasted in travelling, and should have three bed rooms. But I cannot agree with those that consider all not having this number should be pulled to the ground. In many cases where this has already been done, three could have been thrown into two; in other cases, a little expenditure would have added the necessary requirements, and they would have been no longer a nuisance, offensive to the sight. I would ask landed proprietors never to pull down a cottage before they have a new one fit for the inmates of the old. This wholesale destruction of cottages has seriously injured many parishes, and the want of them is very pressing, where those destroyed may have been easily made available, and comfortable for old couples, and young ones without families. In the parish in which I reside many old cottages have been destroyed of late years, without anything like an equivalent of new ones being built. And with what result do you suppose? Why the clearing it of its most useful members, for few men are to be found there between the ages of twenty and thirty. I have had the curiosity of examining our parish register; I there found it had already told seriously upon the number of marriages. During the last six years only four couple of our poor had been so united, whilst in the preceding six years, before their cottages were pulled down, I found twenty-three couple had been married. Surely this cannot be right, this cannot eventually be for the good of either the parish or our country; and yet this has been done by a gentleman who I believe is second to no one in good feeling for his poor neighbours. I agree in thinking all new cottages should have three bed-rooms—and just half of mine have this number. All large grown-up families should have cottages with this accommodation, that no mixing of sexes in one bed-room should occur; for what can be the use of teaching morality in our schools by day, and immorality in our cottages by night, without giving even an opportunity of its being otherwise? I know it must be one of the greatest drawbacks a poor man can have, when trying to bring his children up to be useful members of society, to put him to live in a cottage with one bed-room; in fact, these cases are too frequently the cause of much crime and iniquity. I consider to every hundred acres of land there should be at least two cottages, and frequently three would not be too many, and to each cottage from thirty to forty perches of land, and then allotments would not be necessary. They should also have a fuel-house, and pig-stye. It gives me pleasure to see a poor man with a pig always in his stye. Before I pass on to the last part of my subject, let me ask landowners to take this matter into their serious consideration. In most cases they will find their tenantry well pleased and ready to assist them, that young men may find it in their power to get a home for the object of their choice, and not be driven from their parish, and thus allowed to diminish amongst us, for they are the arm of our strength both in peace and at war, and are all required in this time of great agricultural advancement. I will now proceed to consider the wages and advantages of the agricultural labourer. It is calculated that one labourer is required to every thirty acres of land, with equal portion of arable and pasture, and a few extra at harvest according to circumstances and the quantity and quality of the arable land, the cost of the management of which also varies, but is generally between 30s. and 40s. per acre. In manual labour I believe these figures to be tolerably correct, and if it be so, it will be no difficult task for us to satisfy ourselves whether we are individually above or below this amount. The mode of payment in this county has mostly been partly in money and partly by no end of perquisites—a custom that has long been established between master and man, and one that I should have supposed did nor require the interference of third persons; for though in the case of a few close-fisted men it is possible somewhat to abuse it, still on the whole it is one that provides for the comfort of the poor as well, if not better, than any other that can be devised. In many cases it ensures for the family a comfortable home, fuel, cheap bread, and potatoes under all circumstances, regularly supplied. Notwithstanding this, it has, undoubtedly, been the cause of many hard sayings. People, from not understanding the true state of things, have held us up to the derision of the public, and made us the butt of the nation. Mr. Fowler then read an extract from the *Journal* of the Bath and West of England Society on "The Labourer's Pay whether in Money or in Kind," which went to show that the latter system was not altogether bad, as the labourer was saved the retailer's profit, and had the staff of life supplied at a reasonable price in time of scarcity. He then proceeded: I cannot, however, but express my surprise that such a society as the Bath and West of England should have opened their *Journal* for such a purpose, and publishing such a statement as can be found in the essay of Messrs. Spinder and Isaac, in the last year but one. They have not only published it, but awarded it their prize, thus stamping it with all the authority this society can give it. I should naturally have supposed that some evidence would have been given to prove the position they have given our county—viz., the lowest in the scale of payment for labour of all in the West of England. They certainly published statements given in answer to their own questions, from my Lord Portman, and Mr. Harvey, of Sturminster, but not one from any farmer in this county. As far as I can understand these answers, they are at variance with the conclusions these gentlemen have arrived at—they have nothing in them but what is in accordance with my own views. I will read to you the statements, and the answers on which they are founded. I will also read to you the evidence I am prepared with, and for which I have to thank many gentlemen in different parts of our county, and then trust to a discerning public to judge if the agricultural labourer of this county is in that miserable position which he is constantly supposed to be. I trust before we part this evening we shall satisfactorily prove the statements of Messrs. Spender and Isaac to be void of foundation and truth, for I consider it a positive duty, when such statements are made, to come forward with facts; and although it is not at all times desirable to publish our private affairs, I have determined to give you my labour account as it has actually been paid, during the past year; and that no mistake may be supposed to have been made in the value of their perquisites, I am prepared to give my men the amount in cash I have valued them at, if they will accept it, or I will give any one the amount, that will find my men in their perquisites for the next seven years. The only payment I cannot guarantee the exact amount of is their ale; but I have endeavoured to place that rather under the quantity than over what they actually get. I employ my men as much as possible at piece work; it gives the best labourers advantages; it relieves me of having to see they keep their regular hours; and they know as they work so they will be paid, be it more or less. I have taken for my use this evening the wages of fifteen men, who have worked for me and my father a great number of years, averaging seventeen each man. I value their house and garden at £4 per annum; their fuel at its cost; their flour I consider to be worth, on an average of seven years, 6s. per bag more than I charge them for it; and their potato land ploughed and prepared at 1s. per perch, each man being allowed a day to plant and a day to dig up at my expense. My plan of supplying them with flour is different from that of my neighbours, though it has the same end in view. If I employ a man it is to my interest to place him in a position to provide necessaries for his family, be it large or small; I consequently allow them whatever flour they require at 30s. per bag, which is equivalent to good wheat at 5s. per bushel, it being entirely optional to themselves what quantity they have. I have other men than those whose wages I shall presently read to you, but they are not strictly what are known as agricultural labourers. For instance, one who works in the wood for my landlord in winter, and for me in summer; this man has house, garden, and fuel free, and his earnings are not less than from 15s. to 18s. per week. Another, who makes my hurdles, cribs, and spars in winter, and is at piece work in summer, earns at least 15s. per week. To another, who does the rough carpentering for Mr. Ffooks and myself, but has no pretensions to a tradesman, we pay 15s. per week; and others who have not worked for me any length of time, or are irregular workmen, I shall entirely disregard; and be it remembered if our labourers are ill, *i.e.*, our regular labourers, we pay them pretty much the same as if they were at work. Of course this does not apply if the illness is of very long duration. They have also many other little advantages which partake of a charitable nature, such as a supply of coals, where wanted, at a reduced price, clothing clubs, and the like. Mr. Fowler then submitted the subjoined labour sheet (see the next column), which will explain itself, with the few preceding remarks.

After reading a variety of testimony to show that the above was not an exceptional illustration, Mr. Fowler quoted an extract from the prize essay of Messrs. Spinder and Isaac, in which the wages paid in Dorsetshire were stated to be 7s. per week, or the lowest in the four western counties. He then continued:—I have had many letters from farmers in different parts of the county, and from them I find in the neighbourhood of Bridport the average sum paid to the best labourers is about 10s. per week in cash and 3s. in perquisites—total 13s. per week. From the neighbourhood of Dorchester the average of my communications gives the cash payments and perquisites rather higher, viz., 10s. 6d. in cash and 4s. in advantages—total 14s. 6d. per week. From Purbeck I find the average still higher—cash payments 11s. 6d. per week, perquisites 4s. per week. From Sherborne also I find the best labourers earn, on an average of the statements I have received, 11s. 6d. per week, with a large quantity of cider; but their advantages are not so numerous as in other parts of the county, though they take more holidays. From Winborne my information leads me to believe the wages are about the same as at Dorchester, 10s. 6d. per week in cash, perquisites 4s. I have a statement of the wages of Mr. Saunders, of Watercombe; but as it has already been published, I do not propose to refer to it more than to say it can be found in the February number of the *Farmer's Mazagine*, page 123. You will see from these statements the average of my own labourers are somewhat higher than those of others that I have read, and I account for it from the fact of my being a tradesman as well as a farmer, and thus having had it in my power to use them, I trust, to our mutual advantage. It obliges me to give them more ale, making that portion of their advantages appear very high; but I know it is much better for them to have their ale from my cellar than to be running to a public-house for it; where, instead of having a pint as they at first intended, it too often leads to drunkenness. Now, if all these statements that I have read to you be correct, and I pledge you my word that I have used my best endeavours to make them so, what becomes of Messrs. Spinder and Isaac's statement? The one or the other must be grossly wrong. I will not pretend to say for a moment but dark spots may be found in our county; but I do not believe that in any one single instance any extensive employer of labour can be found whose wages will bear out the statements of these gentlemen. The only evidence they give is that of Lord Portman ond Mr. Harvey. The former says the wages are variable, and the latter sets them down at 8s. to 10s. per week, with "occasionally ale and cider during the winter and spring." He means, I should think, during spring and summer. Yet this is the evidence on which these gentlemen put

Labourers.	No of Weeks at Work.	Cash Payment for the Year.			Average per Week.		Value of House and Garden.			Value of Fuel.			Bags of Flour.	Advantage at 6s. per bag.			Value of Ale.			Value of Potato Land.			Total Perquisites.			Total Payments.			Average per Week.		
		£	s.	d.	s.	d.	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1. Foreman	52	35	18	8	13	8	4	0	0	3	15	0	8	2	8	0	5	0	0	1	10	0	16	13	0	52	3	8	1	0	0
2. Carter	52	27	3	4	10	6	4	0	0	3	15	0	6	1	16	0	4	0	0	1	0	0	14	11	0	41	14	4	0	16	0
3. Ditto	49	25	15	5	10	6	4	0	0	3	15	0	8	2	8	0	4	0	0	1	0	0	15	3	0	40	18	5	0	16	9
4. Shepherd	52	23	19	4	9	3	4	0	0	3	15	0	7	2	2	0	5	0	0	1	5	0	16	2	0	40	1	4	0	15	10
5. Maltster and thatcher*	46	34	10	4	15	0	4	0	0				6	1	16	0	10	0	0	1	0	0	16	16	0	51	6	4	1	2	3
6. Maltster and labourer	52	39	2	3	15	0							6	1	16	0	8	0	0	1	0	0	10	16	0	49	18	3	0	19	3
7. Labourer	52	28	5	0	10	10	4	0	0				4	1	4	0	4	0	0	0	15	0	9	19	0	38	4	0	0	14	8
8. Ditto	52	27	12	0	10	5	4	0	0				6	1	16	0	4	0	0	0	15	0	10	11	0	38	3	0	0	14	8
9. Ditto	52	28	9	3	11	0				2	0	0	8	2	8	0	4	0	0	1	0	0	9	8	0	37	17	3	0	14	6
10. Ditto	52	25	7	7	9	9	4	0	0				6	1	16	0	4	0	0	1	0	0	10	16	0	36	3	7	0	14	0
11. Ditto	52	26	1	2	10	0				2	0	0	6	1	16	0	3	0	0	0	15	0	7	11	0	33	12	2	0	13	0
12. Ditto*	46	26	17	7	11	8							6	1	16	0	3	0	0	0	15	0	5	11	0	32	8	7	0	14	0
13. Ditto	52	26	2	7	10	0							4½	1	7	0	3	0	0	0	15	0	5	2	0	31	4	7	0	12	0
14. Ditto	52	26	2	0	10	0							2	0	12	0	3	0	0	0	10	0	4	12	0	30	14	0	0	11	10
15. Ditto	52	21	19	6	8	3							4	1	4	0	2	0	0	0	10	0	3	14	0	25	13	6	0	9	10
	765	422	18	0																						580	3	0			

* Nos. 5 and 12 were away six weeks sheep shearing.

Average per man per week, 15s. 2d.

down the wages in this county at 7s. per week! Why their own return shows that the cash payments are from 8s. to 10s. But on this testimony the Bath and West of England Society awarded them the prize, thus giving an official stamp to the gross misrepresentation that had been made. I need not tell you that this is the reason why the funds do not flow in so quickly to the exchequer for the forthcoming meeting at Dorchester. I can only say that if they have no better use for their money than to publish such statements as these, I consider it would be better in my own pocket. I will now conclude, thanking you for the attention with which you have listened to me, by proposing the following resolutions:—

1. It is the opinion of this club that more good cottages in this neighbourhood are required for the proper accommodation of the labourers.

2. That the statements of Messrs. Spinder and Isaac in their essay, as published by the Bath and West of England Society, so far as regards the wages of the agricultural labourer of the county of Dorset, are incorrect and without foundation.

3. That the wages of good labourers in this county are paid partly in money and a variety of perquisites, but cannot be of less value than 12s. per week.

(Mr. Fowler was frequently applauded during his address, and sat down amid general acclamation).

Mr. H. **Fookes** hoped that after the able manner in which Mr. Fowler had treated this subject, the stigma under which the county had been lying would be removed. Living as he did side by side with that gentleman, he could fully bear out the correctness of the statement respecting the wages he gave. His (Mr. Fookes') men had pecuniarily the same advantages, and he found there was very little difference in the wages he gave his shepherds, carter, and labourers, from what had been stated by Mr. Fowler. After giving particulars in proof of this, he also corroborated the statement as to young able-bodied men becoming scarce, and expressed his belief that this would not be the case if they could get proper cottage accommodation. He had not a yearly labourer on his farm, but always "gave a week or took a week." In the lower part of the county he thought the Dorchester Candlemas hiring fair was a great curse. (Hear, hear). He knew, on good authority, that there were a certain class of labourers that could not be happy unless they went to a fair yearly, to try and get a better place. One farmer, last fair, agreed with six-and-twenty labourers, and if so that number must have left their places. (Mr. Lock said the fair had sprung up within the last forty years). Candlemas, too, was the worst time that they could change their shepherds, as the lambs were just coming in, and it was most inconvenient. He had never hired a labourer at the Candlemas fair in his life. Mr. Fowler had not touched upon one subject connected with wages, which was the crime of the county. He was proud to say that if they looked at the statistics of crime, it would be found that Dorsetshire was lowest on the list. He thought this would prove that their labourers were tolerably well off, because if labour was badly paid there would be more crime committed. He fully coincided with the general remarks of Mr. Fowler, and hoped they would prove this evening that the labourer in the county of Dorset was as well paid and as happy as in any other county in England.

Mr. G. **Harding** was sure everyone must feel convinced that Mr. Fowler had taken a vast deal of trouble to give an impartial statement of the rate of wages in this county. He then offered a few remarks on the injurious effect which the encouragement of emigration had upon the home-labour market by taking away the best families that could be found, and contended that the value of the land itself depended upon the supply of hands they could get to work it, and these they could not expect without proper cottage accommodation. It was thus very bad policy for a landlord to lessen the number of cottages on his farm. As to the rate of wages, Mr. Fowler had plainly shown that the statements made in the prize essay of the Bath and West of England Society were most incorrect; but he thought neither the wages of the maltster or the foreman should have been taken into consideration. However, enough had been proved to show that the county was not deserving of the stigma cast upon it—that the farmers were almost the most illiberal towards their labourers of any in the kingdom. He had always seen the advantages to the labourers of the perquisites; but ever since he had been in the county he had followed the system of money payment, both for the sake of his own credit and for the sake of economy. He was quite sure it would not detract from Mr. Fowler's statement when he said money-payments were the most economical, besides which it saved the credit of having it said his labourers only received 7s. per week. He considered that great injustice had been done the county by publishing a statement that could not be borne out, and regretted that it should have occurred to operate against the support of what they were taught to consider such a useful society as that which was about to meet at Dorchester this year. They were, however, justified in passing a vote of censure on those who had so recklessly maligned them, and he considered Mr. Fowler was entitled to their warmest thanks for having dealt with the subject in such a satisfactory manner.

Mr. H. **Richards** said he could only rise to confirm almost everything Mr. Fowler had stated. He dealt in what the world called the "truck system," but he found it was so far valued by the labourer, that when a young man got married he often said, "Won't you let me have grist?" Now if they got less than their money's worth they would not ask for it. After touching upon the system of allowing the men ale at harvest time, which he did not think could be altered to give satisfaction, he observed that he was not one of those who went to the hiring fair. His men were like the gate posts, and many of them had been there longer than he had. With regard to cottages he thought landlords took a wrong view in lessening the accommodation, in order not to get, as they considered, too much labour in the parish. If it was not provided by the landowner, it was in some measure by speculators, who built miserable little cottages, for which they exacted a high rent, collecting the money monthly, and serving a monthly notice to quit, so that if the money were not paid the family had to leave. That system prevailed in his parish; but he hoped a better state of things was springing up, as the heir apparent was taking a great interest in the matter, though he thought there was danger in going beyond the mark and building too expensive places. As to emigration, he was once asked by a clergyman to give a subscription for such an object, and he replied, "If you will let me select the men, I will readily give my subscription; but here you are sending away the very best parent stock, leaving behind the lazy, the drunkard, and the imbecile." Although a cottage under the miserable system he had been speaking of would come to about £3 18s. a-year, yet in estimating the advantages to the tenant he did not think they should reckon above 1s. per week, not but that the farmer would be ready to give £5 a-year if he could have as many good cottages as he wanted. He also thought that the farmer should have the control of the cottages for his labourers. When he had a good labourer nothing would be more likely to enable him to keep him than having a good cottage for his accommodation.

Mr. J. **Ford**, jun., said he had travelled through many parts of the country, and he never saw that labourers were better fed and better clothed than they were in Dorset. He paid his men in money, and thought it would be better if all did so. On looking through his labour book he found they averaged about 12s. per week, and he had not a man in his employ but what got 9s. or 10s. a-week. If he could have more cottages than he had it would be a great advantage. Young men when they got married sometimes went to live in the back streets of a town, such as Blandford, and they were very little use to a farmer afterwards.

Mr. G. **Summers** made a few complimentary allusions to the able and impartial manner in which Mr. Fowler had treated the subject, and the important testimony he had brought to bear upon it from gentlemen they knew to be of high standing in the county, though it was not likely that they paid higher wages than their neighbours. When he saw Mr. Saunders' statement he thought it rather high, but on looking over his accounts it was about the same as his own. As to education, he thought it would be better if they had more schoolmasters than mistresses, because the former had greater influence over the boys; and he also thought a great deal of good might be done by the establishment of evening classes, which would keep the young men from idleness and evil speaking. It was desirable the labourers should have good cottages, but it was also necessary to attend to their habits as well as their accommodation. With respect to wages, he considered it a bad plan to pay all men alike, and thought they should begin a different system and pay a man according to what he earned. He believed the advantages of the agricultural labourer in this county were very great, and hoped their proceedings this evening would go forth to contradict the unfounded statements that had been made with respect to their position.

Mr. **Joel Roper** said he had made a calculation of what a few of his best men received. His hedger, independent of fuel, grist, a cottage at 6d. a-week, and potato ground which was dunged for him, had had at the rate of 13s. 7¼d. a-week. Another, independent of advantages, got, on an average, 17s. 6½d. per week; and another 12s. 0¼d.; while several young men, besides grist and potato ground, averaged about 9s. 9d. If they looked into the village church on a Sunday, they would see there was not that poverty which was represented in the Bath and West of England Society's Journal. He had taken the trouble to select a list of the wages paid in many counties from Morton's Encyclopædia of Agriculture, which showed that this county was not in comparison so bad as was represented. In Yorkshire wages were from 10s. to 12s. weekly, with cottage rent 50s. to 60s. a-year. In Derbyshire, wages 10s.; and rent £3 to £5. In Cheshire, wages 8s. or 9s.; and rent, £4. In North Lincolnshire, wages 10s. to 12s.; and rent, £4 and even £6. In South Lincolnshire, wages 9s. to 10s. In Norfolk and Suffolk, wages about 8s.; and rent 50s. to 70s. In Worcestershire, wages 7s. to 8s.; and here the custom prevails of giving beer or cider, about half-a-gallon a-day. In Herefordshire, wages 7s. to 8s., with cider. In Gloucestershire, wages 7s. to 10s., and from two to three quarts of beer. In Essex, wages 8s. to 10s. In Surrey and Kent, wages 9s. to 10s. In Sussex, wages 8s. to 10s. Mr. Roper, in reply to Mr. Atkinson, stated that he gleaned these particulars from the edition published about three years since. He thought Dorset would well stand a comparison, particularly when they considered that cottage rent was, in many instances, so much more reasonable in this county.

The **Chairman**, after complimenting Mr. Fowler on his treatment of the subject, observed that some allusion had been made to education. Now, he was not one who objected to the education of the poor man, but he thought it ought to be based on a right foundation. In the present day he was afraid, instead of having an education useful to them, it was an injury, especially the females, who were taught crochet and net work, and such things; but when they became mothers, they did not know how to mend a stocking, and became a drag upon a man instead of a help to him. As to cottage accommodation, it was almost useless to teach morality at school if it were untaught at home. He recollected that in a pamphlet written by a gentleman on this subject, Stourpaine was held up as being one of the worst places in the county, and some persons might think Lord Rivers was to blame. But his lordship had no power over the objectionable cottages which were built on small freehold or lifehold land, without any outlet except that into the street. He was, however, happy to say Lord Rivers was setting a good example in that neighbourhood, by building cottages with every convenience the poor man could require. He thought the present law of settlement ought to be altered, as that in many instances caused landlords to refrain from building, for fear of increasing the poor-rates. As to wages, his shepherd had 8s. per week and perquisites which brought it up to about

11s. He had been with him and his father more than forty years, and now expressed his intention to retire, as he had got enough money in the bank to keep him. (Hear, hear). His carter, in wages and perquisites, received about 12s. per week, and his best labourers about 10s. 6d. That his men remained so long with him was a proof that they were not in a very bad position.

Mr. **Fowler** then made a few observations in reply, but said he had very little to say, as most of the speakers agreed with the remarks he had made. With respect to Mr. Fookes' allusion to crime, he had cut out of a paper some statistics which showed that the county of Dorset had the least per-centage of crime according to population, but he was sorry that he had mislaid the scrap. He perfectly coincided with the remarks about the Dorchester hiring fair, and believed it had now become quite a nuisance in the county. He knew two men, brothers-in-law, who had been there for hiring regularly for these last thirty years. Mr. Harding thought he should not have brought into his calculation either the foreman or maltster. They would, however, remember he had said his wages were perhaps higher than others, because he made use of his men as tradesmen; but they were nothing but agricultural labourers when they began. Besides, the maltster was employed on the farm in summer. Mr. Richards thought he placed the advantage of a cottage too high at £4 a-year, but they must remember in valuing labour they must estimate what it cost the farmer. If the farmer did not provide a cottage, the labourer would have to get one himself. As to paying in money, he looked more to his men's comfort than what people said. He had come there to show that what was stated respecting the Dorset labourer was incorrect, but whatever was said would not cause him to put his men in a worse position by withholding their perquisites. If, however, they would rather have the money he would give it them, or he would pay any gentleman to supply them at the rate he had estimated. Mr. Fowler then successively proposed the resolutions which he had read, and they were respectively seconded by Mr. J. Ford, jun., Mr. Rawlins, and Mr. G. Keynes, and carried unanimously.

On the motion of Mr. G. Keynes, seconded by Mr. Summers, a vote of thanks was passed to Mr. Fowler, and a similar compliment to the Chairman concluded the proceedings.

ON THE MANAGEMENT OF SHEEP, IN BREEDING, FEEDING, AND DISEASE.

BY JAMES B. BIRD, RENTON BARNS, BERWICKSHIRE.

[Premium—The Gold Medal.]

That the breeding of sheep alone, or the breeding and feeding of them combined, where soil, situation, and rent are suitable, is one of the most profitable departments of farming, has long been the experience of the most of upland farmers. Such also is the opinion that seems to be spreading rapidly now, even amongst numbers in the lower districts, who, while wheat continued to realise the very remunerating price of £3 or £4 sterling per quarter, and barley and oats proportionably high, never for a moment, perhaps, gave one serious thought as to the possibility of breeding sheep at a profit on their first-class high-rented land; choosing rather to buy them from those who could breed more easily, at a price which, considering the heavy expense incurred in producing a fair crop of turnips, as well as the great mortality amongst the sheep themselves, in some seasons left anything but a remunerating sum to encourage the feeding of them as a lucrative transaction; very probably often a loss, expected to be repaid by the succeeding white crop; but who, now when good quality of wheat brings only about £2 sterling per quarter, while mutton in the wool is at 8d. per pound, and wool itself at 30s. to 40s. per stone, begin to think, with reason, that even with heavy lands something may be done in the way of the breeding and the feeding of sheep combined. Rents must be paid; grain at present prices cannot do so; and not a few who some years ago kept not one ewe, now, as a matter of necessity, turn their attention to breeding. That such may be done successfully and profitably on many a farm, on which, at no very distant date, the bare idea would have been regarded as the height of folly, but which now, through drainage, followed by heavy limings, have not only made a very great alteration in their general aspect, but a materially beneficial change in their very nature, there seems every reason to expect. And yet the possibility exists that such expectation may practically meet with disappointment. For although, in the breeding, rearing, and feeding of sheep successfully and profitably, much, *very much*, is due to good and efficient management, which can only be gained by experience, as well as the natural inclination and taste for it; still, on the other hand, as well known to every one, certain soils and situations are by nature much more adapted for sheep, and being so, will undoubtedly prove themselves at all times quite superior to all the efforts of art, not only in the breeding but the feeding of them. So much less loss from sickness and death, and in the end producing to the butcher a much better killing animal as well as a better clip of wool to the stapler.

Waving any further preliminary remarks, I will now attempt, as lucidly as possible, to give an account of how the flocks on the two farms with which I am connected are successfully managed. Both farms are situated in the eastern and lower part of the Lammermuirs, in Berwickshire. The highest and most extensive of the two, which has mostly a north-eastern exposure, contains about 300 acres permanent hill-pasture, mostly dry, with a subsoil composed in a great measure of rotten rock, and sound and healthy for sheep; the grass being interspersed more or less with heather and whins, both of which are readily eaten by them in winter; while the rich yellow blooms of the latter are much in request amongst the lambs in summer. It also contains annually about 240 acres of grass and clover, one and two years old. The smaller and lower-situated farm, which lies a little to the north-east of the other, has chiefly a south-western exposure, and is possessed of a few fields of dark-coloured rich loamy soil; the remainder and larger portion of it, as to depth, character, and quality, being very much upon a par with the larger farm; a great deal of the soil, though thin and bare, being naturally adapted for the production of grass and turnips. It contains annually about 200 acres of grass of the first and second year's growth (excepting a small proportion permanent and waste, which is generally pastured with cattle), sound and naturally well suited for sheep, the wetter fields having been all pretty well drained, So much for the farms, and now for the stock.

It may be as well to mention first, that the management of the sheep stock is founded on and ruled by the desire to obtain the following results —viz., by a judiciously liberal feeding of the ewes, to procure from them annually a very large return of lambs, it being thought more profitable thus to cause many of them to produce two lambs, than, by an injudicious withholding from them, particularly at certain seasons, a plentiful supply of food, have each only producing one, the wool in the one instance being also superior to the other, both in quantity and quality; to have the feeding flock—by endeavouring to keep them always in a progressive state—ready for the butcher at a very early age, at heavy weights, and leaving large returns of profits; to procure an excellent clip of wool, both as regards quantity and quality, from the breeding as well as the feeding flocks; and, lastly, to have as small a per-centage as possible of loss from disease and death.

The breeding flock, which consists of somewhere about twenty scores of half-bred ewes—a cross betwixt the Leicester and the Cheviot—are, as a rule, kept constantly on the larger farm, so that they may derive the benefit of the permanent hill-pasture. They are of three different ages, two, three, and four years old, a third part being annually drafted and sold off at four years of age, after rearing their third crop of lambs. They are sold during the month of September to farmers of a lower district, who take another crop of lambs off them, and then feed them for the butcher. The reason for selling the ewes at four years of age is, because a much better price is got for them at that age, than they would fetch were they kept for another year, when many of their mouths would be getting deficient in teeth. Their room is filled up by the like number of gimmers of the same breed, carefully selected and purchased the previous year, while lambs, usually at Melrose fair, in the month of August. The selection of these is guided not so much by size as general beauty of appearance; such as fineness in the head, symmetrical, and clean-shanked, well-clad, &c., &c.

One point which is thought of very great moment, and rigidly adhered to, is to endeavour to have the ewes at all times, but especially at particular seasons, such as those of procreation and production, in good and healthy condition.

They are put to the tup about the 1st of November, so that there may be no lambs till the very end of March or the beginning of April, when there is an almost certainty of grasses being ready for them, it being thought of much greater importance for the ewes to have plenty of succulent food, to stimulate an ample secretion of milk, to enable them to nourish and rapidly further the growth, unchecked, of their lambs immediately after birth, than to have them lamb a week or two earlier, and run the hazard of an unpropitious spring, thereby allowing their lambs, from want of grass in sufficient abundance to produce a good flow of milk, to get checked and stunted in growth, from the effects of which it might be long ere they fully recovered. At this age, the injurious effects of a check from want of milk are incalculable.

To insure a large proportion of twins, the ewes, a short time before and during the procreative season, have a liberal supply of green food given them, such as rape or turnips. At one time the former was thought absolutely necessary, from its being believed to have a specific effect in stimulating their prolification; now, however, turnips, when given in sufficient quantities, are found practically to be equally efficacious. Either rape or turnips, experience has proved, assist more successfully towards the desired result when given a week or so before the tups are put amongst the ewes. When practicable, it is studied to have the rape or turnip which are intended for use at this season growing adjacent to a grass-field, and the ewes allowed unrestrained liberty to feed on either.

This is of great value in the best of weather, and in wet, quite indispensable; for to then keep them constantly folded on the break, could not fail to prove hurtful. Indeed, when rain continues to fall, it is thought requisite to confine them to the grass-field entirely, carting to them there what turnips they require: or if in such weather on rape, allowing them only to have two feeds a-day, of two or three hours' duration each, and again turning to grass. Let the weather be ever so dry and favourable, however, from the break they are as a rule turned to grass at night; and when much wet rests on the leaves of the turnips or rape in the morning from frost, &c., kept off until the sun or air has partially dispelled it. When this is not attended to, diarrhœa is almost sure to be the consequence to some of them. It may be as well to mention that, during the procreating month, the ewes are generally divided into two or three flocks, or occasionally kept all together from the force of circumstances. It is nevertheless thought the better plan to divide them. Seven, sometimes eight tups are used, five or six of them being close-woolled, well-clad Leicesters, selected and purchased at the sales of some of the best breeders in the county; and two from England, a cross betwixt the Leicester and Southdown, the produce of which, though at times coarse-looking, are found to be fully as easily fattened as those got by the pure Leicester, and on the average better weights.

All of the tups are purchased at one year old, and kept for two, sometimes for three seasons, according as they are found to answer the purpose required of them. They, like the ewes, are also seen to, that they be in proper condition, some time before being allowed intercourse with them. About the end of November and beginning of December the tups are removed, and the ewes are shortened in their quantity of turnips to one feed of a few hours daily throughout the winter—less or more according to the mildness or severity of the weather. When off the turnip break, they either have the liberty of part of the one and two-year-old grasses, or more generally turned to the hill pasture, where they have the heather and furze as well as healthful exercise. Great care is now taken to prevent them leaping fences or ditches, lest the embryo should become inverted in the uterus of some of them, and thereby cause great difficulty and danger in parturition.

Although in some years it is found unnecessary, and not done, generally speaking, the bathing or rather running of the ewes is resorted to for destroying the well-known insect which infests the sheep, commonly termed kade or tick, with a certain poisonous mixture prepared for the purpose, and sold by the most of ordinary druggists. At one time this was done usually before the tupping season, but now from experience it is believed to *have an injurious effect in limiting the number of twins*, and is therefore deferred until the end of December or beginning of January, according as weather permits, when they are very gently handled by the shepherd, and no bad results, such as abortion, which might then *theoretically* be dreaded, ensue. As the lambing season draws near, the turnips are gradually increased to the ewes, until at length, if they are not all the more likely to get into good condition (approaching fat), they are allowed what they choose to eat, so that they may not only be full of healthy vigour for bringing forth their young, but likely to yield abundance of nourishing milk afterwards.

Some may unhesitatingly condemn such liberal and full feeding at this time, lest the ewe, by getting into a condition predisposing her to it, should become more liable to and fall a victim to an inflammatory attack. Without a doubt such danger does exist; but a distinction must be drawn between the healthy, vigorous state then desired, and the one that exceeds it, and which very properly cannot be too much dreaded. When within a day or two of the time of production—preparation having been previously made as to the repairing and plentiful bedding of the lambing shed, getting a supply of turnips stored conveniently near, &c., &c.—the part of the flock which are known by mark as those which produce first, are drawn out from the others and confined in a grass-field, where turnips are carted to them, and where they remain during the day, giving birth to their lambs, closely waited on either by the regular shepherd himself, or one hired in to assist him, to aid any of the ewes that may have difficulty in lambing; if cold, taking them to the shelter of the nearest place, or to little enclosures, made here and there for the purpose, of hurdles and straw, until they get afoot, and begin to follow and suck their dams without assistance, when there is very little danger of them.

At nightfall the ewes are gently driven home into the lambing-shed,* where they receive the same attention, being waited on as through the day; the person that does so turning those that lamb into the small houses prepared for them until the morning, a few turnips being given them from the store at hand. When the morning is favourable—that is to say, dry over head, and not exceedingly cold—the lambs produced over-night are, with their dams, turned to grass some time during the forenoon; twins to young grass, single generally to the older grasses, the fields near the steading being first stocked, the older lambs being gradually transferred to the more distant, to give place to the younger. In wet or severe weather, men, women, or boys are employed to assist the shepherd in driving ewes and lambs into shelter, and keeping them in it, plenty of turnips, &c., being laid down to prevent them wandering out seeking food amid the blast. At such a time, too, warm cow-milk is administered from a bottle carried by the shepherd in his pocket, to any of the lambs that seem really in want of it. It may do all very well for some to protest and affirm "cow milk to be not only objectionable for young lambs, but even extremely hurtful; and that, by taking advantage of some of the ewes that are extra good milkers, its use may wholly be dispensed with." Such may succeed excellently in moderate weather, and with a few ewes and lambs in fold or small fields; but where scores are distributed here and there in large fields and in cold, hard weather, when each ewe, however good a milker, has plenty to do with her own offspring, at such a time a few mouthfuls of warm cow-milk, to such as seem suffering from cold and hunger combined, proves of incalculable benefit—the means of preventing them totally succumbing to their deadly influence. For without a doubt, food, in abundance, in such weather, both to ewes and lambs, is invaluable, as without it, shelter, however good, loses one-half of its renovating effect.

When a stormy day threatens to be succeeded by as stormy and inclement a night, the youngest lambs with their dams are enclosed by a net in a sheltered corner of their respective fields, and straw carted out to add to their shelter and comfort; and in cases of urgent necessity, many of them are taken home to sheds and houses about the steading—a good cart-shed, fitted up in a temporary manner with straw, &c., being very serviceable for such a purpose. As a rule however, young lambs are confined as short a time as possible, as they are found never to thrive so well as in the open air, if the weather will allow at all.

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* This is a long enclosure made by the use of hurdles on one side of the stack-yard, which has previously, during winter, been completely cleared of the stacks which occupied it. To keep the ewes clean and comfortable, it is now and then freshly bedded with clean dry straw. A stone wall, pointed with lime, encloses the north side of this shed, alongside of which, and facing into the shed, are a range of small houses formed with wood and straw—dry, warm, and comfortable—and into which the ewes with their young are confined for shelter till the morning.

When the first lot of ewes is getting nearly all delivered, the second lot is drawn out, and treated in like manner; and so also, in due time, the third and last lot. If turnips can be spared, even in fine weather, a few cart-loads are occasionally laid thinly down in the sheltery bits of many of the grass-fields, which is a great assistance in the way of economising grass, as well as a very acceptable variety of food to the ewes, which eat considerable quantities of them in preference to grass alone, especially when a few cold days set in. For the production of milk, yellow turnips are found to be the best; oats are also thought to have a good effect that way, and are accordingly at times given to some of the worst milkers. Indeed, neither food nor attention is withheld when called for, as both most strongly and urgently are during the lambing season, every means being resorted to which at the time is thought can be of any avail in preserving the lives of both old and young, as well as promoting the rapid and healthy growth of the latter.

The tup lambs are castrated when two to four weeks of age, according as weather will permit—favourable mornings being regarded as quite indispensable for this operation; choosing, rather as castrate in a frost-tainted atmosphere, or in a chill east or north-east wind, to delay for days until the air becomes genial—mild, soft, misty, growthy mornings being what is really desired for it. Instead of performing the operation in the scientific style—of making an incision on either side of the scrotum, and extracting the testicles—the shepherd here finds it much safer to excise the inferior part of it entirely, the blood getting thus more freely away without coagulating and causing mortification internally, as it will occasionally do when performed by the former method. About the middle and end of June the ewes are shorn. About that time the wool naturally begins to fall off itself, and were they shorn a fortnight sooner, more wool might be procured; only the danger then exists of a cold night or two setting in, and not only greatly and (to the lambs) injuriously lessening the secretion of milk, but even, in extreme instances, causing death to some of the ewes. Somewhere near the end of July the lambs are weaned and removed to the other farm, where grass for some time previous had been lightly pastured on purpose for them; where they are out of hearing of the bleating of the ewes, ss well as the ewes of them—thus causing both to settle much more quickly than when nearer; while the lambs, being changed to better pasture, prevents them from feeling to any great extent the sudden and total deprivation of milk. The ewes are afterwards hand-milked for a week or ten days, sometimes a fortnight, according to circumstances; allowing, near the finish, longer intervals to elapse between milkings before ceasing altogether, thus in a great measure preventing the bad effects that might accrue from an overflow of milk being left to stagnate in the udder. By gently driving to and into the fold or bught, and the shepherd's waiting closely on to superintend the milking, seeing that no unnecessary rough-handling or other abuse is practised, the milking is found not to be injurious in the smallest to the flock, but rather beneficial, in its preventing udders from going wrong from over-distention, besides yielding a large amount of rich valuable cheese. For a few days after the milking is left off, the shepherd, in walking about amongst the ewes, keeps a careful look out, lest any of them require to be caught and relieved of part of their milk in the field. Immediately, also, about this time, a third part of the ewes are drafted out, and put into one of the best fields of pasture, to prepare them for sale in September; while the others are kept chiefly on the hill pasture, until the oat stubbles are ready for them.

As to the feeding department, the lambs, which at weaning-time are removed to the lower farm and better pasture, are grazed there until folded on turnips. In dry autumns they are allowed the use of the young grasses as well as the bare stubble; but in the wet, only the latter, it being found that the former does them then more harm than good; they, on the other hand, doing at a very serious and irreparable injury by the poaching of it with their feet. Even in dry weather it is thought advisable to turn them off to older pastures at night; as when young grass is, as it often is at that season, covered in the morning with heavy cold damps and frosts, they ought not to be on it till some time through the course of the forenoon, or height of the day. The feeding sheep having been put on about a month earlier, towards the middle of October the whole of the home-bred or feeding lambs are folded on white turnips—on either farm—of the earlier or middle sowings, the later-sown, even although of good size, being found to cause more sickness and death. A good-sized break is given to begin with, so that they may not by crowding destroy the turnips under foot. As soon as this is ready for picking, a second is given, and so on as required, never allowing them to get too bare before giving a fresh break, as deaths are in that case more apt to occur from eating too much earth-soiled turnip roots in the one instance,* and too greedily of the fresh turnip tops in the next.

They have along with the turnips—in the early part of winter—the use also of one or more of the adjoining grass-fields, on which they can run off and on at will; unless when more than the usual number of deaths are occurring, or the turnip-break getting very wet and muddy from heavy and continued falls of rain, when they are driven into and confined in the grass-field regularly every night for the benefit of a more comfortable lie, as well as change of food. Indeed, in such weather, it is often found necessary to shut them out from the break for days together; turnips being carted to them on grass, until the turnip-field gets again into a condition dry enough to receive them. In severe frosts and snow continued, a very small break is given them daily—what is found they can consume before nightfall: the portion of the bulbs above ground being eaten in the forenoon, and the roots picked up to them in the afternoon. Supporting this method with plenty of good oat-straw, sheep are enabled, in the hardest weather, to get on tolerably well. Towards the middle or end of January, twelve to fifteen scores of the best hoggs, of either sex, are drawn out, and have yellow or swedish turnips cut and given to them in troughs, a store having been previously prepared, in heaps of ten or twelve cart-loads pitted at regular intervals over the field in which they grew. All young sheep beginning at and before this time to lose their front teeth, it becomes of very great furtherance to their increase of growth and condition for the market, to cut the turnips for their use. It insures them a proper supply of food in a form easily consumed; and thus, in place of wandering about from root to root, nibbling from morning to night with almost toothless gums, without ever being satisfied, they walk forward to their troughs, eat what they desire, and then lie down to rest, ruminate, and assimilate. If enough of hands could be had to pull root and store in fine weather, there is little doubt but that it would amply remunerate to cut all kinds of turnips to hoggs at this time. But where there are large flocks and a number of cattle to provide for, this is not often practicable, when it is considered that dry weather for the purpose is absolutely necessary.

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* In some districts, more especially where the soil is of a sandy nature, large numbers of sheep die from eating soiled roots. Sand accumulates in the stomach, and may sometimes be taken out in handfuls. Cleaning and cutting the roots is the only effectual preventive. When it happens that it is not convenient to do so, the stock should never be kept too bare of turnips in wet weather, and more particularly in changes from frost to thaw. This, no doubt, entails a greater waste of food, but the losses arising from deaths will be considerably diminished.—Ed.

Those which are left to eat the turnips on the break, get a good proportion of the bulbs broken for them on the ground by the common picker, as soon as the green tops are eaten over. Such number of the hoggs having by that time lost the whole of their incisors, and the turnips getting so much thicker and tougher in the skin, makes it almost impossible for them to break them themselves. But when split into two or three pieces, allowing them to get an edge on which to bring their grinders into effectual use, helps much to get them sufficient to keep them from falling off in condition until they get to grass, when they improve very rapidly, more so than the lot that gets cut swedes.

If there is not all the greater scarcity of turnips, hoggs are kept off grass until it has grown strong and luxuriant, so that it may not be endangered of being easily cropped before the genial weather of summer sets in to insure its rapid second growth, nothing proving more destructive to young grasses than the eating of them too closely in spring; but where numbers of ewes and lambs are kept and reared such can rearly be avoided.

The lot of hoggs taken from the cut swedes or yellows are allowed the best grasses, to keep them still progressing as rapidly as possible for the market. The greater proportion of them are in prime condition about the middle or end of May, weighing then, on the average, from 17 to 18 pounds a-quarter. Having been washed eight or ten days previously, they are then shorn, and, a few of the worst having been drawn out, sold to the best advantage; the *shotts* being kept on grass a week or two longer, till also fit for sale.

As to the secondary lot fed on white turnips alone (uncut), they too are put to grass about the same time as the others, washed about the end of May, and shorn in June; a few of the best being afterwards drawn out at intervals of a few weeks, according as they are found to get into marketable condition, and sold; what remains on the ground in the end of August being fed off on turnips during the ensuing winter. The half-bred ewe lambs bought in, to replace in due time the ewes drafted out, are usually allowed only about half turnips during the first month or two of winter, but afterwards as many as they can consume; for although it may appear an expensive way of treating keeping stock, the enhanced quality and the increased weight of the *wool cause it more than to pay.*

And now for a very few remarks on the diseases of sheep.

Sheep, on the most of farms, and especially in certain seasons, and during their first year, are exceedingly liable to disease and death. Indeed, with some farmers, the mortality is so great as almost to preclude them from feeding any with a profit, confining their attention in that department wholly to cattle, which are sometimes, in that respect, from lung disease, &c., little better. It therefore becomes a question of very serious importance to all, but especially to such, whether something cannot be done in the way of, in a great measure, effectually preventing or successfully curing those diseases to which sheep generally fall victims. Some of our best veterinary authors, in their works of pathology, minutely and graphically describe the causes, symptoms, and means of cure of the most of these, and which I have read carefully and with due attention. Yet, with all respect for the opinions of these learned and able men of science, I cannot avoid being deeply impressed with the belief—and my impressions are produced by practical observation and experience—that the real and important question is, *not so much as to how many of the diseases affecting sheep are to be cured, as to how they are to be prevented.*

I attended at Clyde-street Veterinary College, session 1851-52, and listened to the able and thoroughly practical instructions of Professor Dick on pathology—to the calmly delivered, clear, scientific, and never-to-be-forgotten lectures of the late Mr. Barlow on comparative anatomy—to the earnest and intelligent Mr. Finlay Dunn on materia medica—and to the highly-interesting and impressive lectures of the late Dr. George Wilson on chemistry—than which a better and more able staff of teachers of the veterinary art need not exist. I returned home in spring, flushed in theory with the already sanguine anticipation of seeing the most of diseases affecting the domesticated animals vanish before the potent appliances of my newly-acquired art. With horses and cattle I was not altogether disappointed. In them the symptoms often point pretty clearly to the seat of disease, and the means of cure employed have not been altogether unsuccessful. With sheep, however, I was doomed to disappointment, and find it totally otherwise. I had often heard, years before, farmers and shepherds, men of experience, talk about, as a well-known fact, of a sheep being very difficult of cure; but now I experienced it. I felt totally baffled and disheartened. Sheep were brought home unwell without showing any peculiar symptoms so as to firmly guide the judgment as to what treatment to pursue. Purgatives, bleeding, sedatives, stimulants, were too often used almost at random, and too often unsuccessfully, the most of cases terminating fatally ere the medical treatment could have any effect, which, on *post-mortem* examination, often showed little or no appearance of great disorganisation internally to which could reasonably be attributed the cause of death. The gall rather gorged-looking perhaps, or the bladder unnaturally full, gas-distended stomach, or spots of slight inflammation here and there on the different viscera and glands, especially in feeding sheep which have previously been doing well, are generally the only signs of disease that can be seen internally after death.

Undeniably there are a few diseases affecting sheep, however, which, by plain and well-known symptoms, give certain indication as to what is wrong, such as diarrhœa in thin and improperly-fed elder sheep and hoggs, inflammation in ewes after lambing, hydatid in the brain (*alias* sturdy-turnsick), &c., which, by their course not being so rapidly run, give the practitioner a little time to attempt and effect a cure. And before saying more as to the means of prevention, I will first give here a few details as to how these have been by me successfully treated.

Diarrhœa.—This disease, so far as my experience goes, when not arising from the effects of some other disease prevailing in the system, chiefly affects lambs after being changed from grass to the turnip-break, especially if then in poor condition. Some seasons those affected soon again get well without any treatment whatever; while in others, again, the attack is very virulent—so much so, that if not promptly met and checked, it in a short time proves fatal, impairing the appetite; the bowels and digestive viscera generally getting into a state of irritation so great as to almost wholly unfit them for assimilating any of the food, it passing off almost as when chewed in an unintermitting purge; abdomen getting very much tucked up; hollow sunken eye and weak staggering gait; death seemingly being caused occasionally by pure inanition, if dysentery does not first ensue to cut off at an earlier stage. In the cure of this disease I have used opium and castor-oil with success—a scruple of the former to two or three ounces of the latter, given once every other day, or oftener if necessary, until the patient begins to show signs of recovery. Sometimes the first dose proves enough, and nothing more ought to be given than is thought absolutely necessary, lest it do harm.

In the first stage of diarrhœa I have seen the use of scalded flour prove very beneficial in the way of cure, made of a consistence that will allow of its being easily administered out of a bottle, and given in quantities of about a choppin, or two English pints, two or three times a-day; but when not found very early to take effect, no time is lost in resorting to the opium and castor-oil.

Hydatid in the Brain—Sturdy-turnsick.—This is a disease affecting chiefly hoggs, too well known to need here any description as to symptoms. Those, I think, that are much exposed and poorly fed are more predisposed to it; but very probably the cause or causes still remain in obscurity. A certain cure of at least 50 per cent., however, has now been discovered, and in limited use for several years. It is effected by the use of a case of instruments made specially for the purpose by several instrument-makers in Edinburgh—Hilliard, in Nicolson-street, is one; M'Kenzie, opposite the College, in the same street, is another. The case consists of an instrument, with a shield upon it, for first perforating the skull; a small trochar and canula, which are next inserted, the former being then withdrawn, and the latter left as a canal through which the water is extracted from the brain by a syringe made to fit exactly into the mouth of the canula. The operation is exceedingly simple, and may be performed by any master or ordinary shepherd who chooses to act exactly according to the printed directions given along with each case of instruments. Some talk of curing 70 to 80 per cent., or more even. Very probably the per-centage of cures depends very much on the breed, strength, and condition of the sheep practised upon. For my own part, I will, I think, first and last, have attempted a cure on about 40 or 50 hoggs, once and twice crossed with the Leicester from the Cheviot, and proved successful in curing fully half of that number. The greatest proportion of the cures were made when the disease was not too far gone, before it had reduced the patient to a very great extent, when the weather was temperate—when kept quiet, and not allowed to go out too soon after the operation. Perhaps the most profitable way of dealing with sturdy sheep in good condition is to sell them at once to the butcher for what they will bring; but amongst ill-bred, thin-keeping stock, this invention of cure must be of very great value, saving many a hogg which, if allowed to die, or killed at the time, from its leanness, could be of little or no value, but which, when cured, thrives, feeds, and sells as well as any of the others.

Inflammation after lambing is another very common and exceedingly fatal malady amongst ewes in certain seasons, more especially if they have been too full fed, causing lambs to grow unnaturally large before parturition, thereby increasing the danger to the mother, already predisposed by high condition to become the victim of this disease. When the symptoms of its attack are given, by heaving and after-throes coming on a few hours, or it may be a few days, after lambing, a pail or pitcher full of water—spring water, as cold as can be had—is taken and poured over the loins and hind-quarters of the patient by the use of a smaller vessel, held as high as the arm can reach, to cause a greater shock when the water descends. It is wonderful to see its salutary effect. The ewe, which before had been panting, heaving, and throeing, becomes instantly quiet, soothed, calmed, and relieved, while the cold icy spring-liquid descends upon her. By-and-by, however, the throes return, when the water is again had recourse to with the same visibly good effect, and so continued at intervals until the gradual and finally permanent cessation of the throes plainly indicates that the malady, with its concomitant dangers, has been energetically met and conquered. This cure, however simple—so simple that some may perhaps never try it from unbelief in its efficacy—I have experienced as almost infallible. The prescription of it was given me by a friend three or four years ago, who first procured it from a hill sheep-farmer, whose name at present has quite escaped my memory, although to him, I believe, is due the credit of the discovery. The shepherd here has tried it in at least a dozen of cases, which he stoutly affirmed, and I from unsuccessful practice believed, would, by the ordinary treatment of bleeding and administration of sedatives, such as opium, &c., all to a certainty have died, but which, by the application of the water, all but two, I think, recovered. While undergoing this treatment of cure, the ewe is kept sheltered from draughts of cold or scorching heat, both being extremely hurtful. A dose of two ounces of Epsom salts is also given to keep the bowels in proper order.

Garget.—Garget, or inflammation of the udder, is first prognosed by a slight redness and heat in one or both sides of the udder, which is accompanied by an unusually large secretion of milk, which very soon degenerates into milk and serum, next into bloody serum, and lastly to gangrene, which, if not checked, rapidly spreads down inside the thighs and along the abdomen, ending fatally. The supposed causes of its production are—from the ewe having sore teats, refusing to allow her lambs to suck, inflammation being in consequence set up by her retention of milk; sudden changes in the weather from heat to cold, and *vice versâ;* too succulent pasture. But, in reality, cases now and then occur seemingly without any exciting cause whatever. When a ewe is observed to move off whenever her lambs attempt to suck, she is at once caught and examined, and if her teats are seen to be all sore, cleaned, and touched with a little caustic or other application, and her udder emptied at least once a-day by the aid of an ordinary silver teat-tube. When it is thought to be the pasture that is the cause of it, they are changed to another.

In the cure of garget I have seen poultices, fomentations, cold washes, each and all applied at the first stage, to endeavour to stay the inflammation from running to gangrene, with seldom any success, the most of the cases going to gangrene in at least part of the udder. When this shows itself by discoloration outside, a deep free incision is made, and oil of turpentine, or some other potent stimulant, poured into it two or three times a-day, to bring it to a healthy suppuration. A liberal allowance of strong sweet ale is also given. Bleeding and purgatives are avoided almost from the very first, being found to hasten on mortification, when purgation arises spontaneously. Notwithstanding all that can be done, some of the ewes will sink and die, while others gradually rally; healthy suppuration ensues, and the gangrenous portions slough off, when the sores, though very deeply seated and bad to look at, from the acquired healthy action, rapidly heal up, the ewes in a short time becoming again quite strong and healthy—unable, however, from their udders being wholly or partially destroyed, to rear their lambs, which have to make the best shift they can on cow-milk.

Such are a very few of the most common diseases attacking sheep, which I have experienced as giving unmistakable symptoms to guide the judgment as to what treatment to pursue, and often with success. And yet, I again repeat, as to the generality of diseases, especially those prevailing most among feeding sheep, my firm belief is, we must look to the prevention of them as the real sheet-anchor of success in sheep husbandry. Probably, let the treatment pursued in the management of sheep be ever so good, and naturally adapted to the promotion of their health, a certain quantity of deaths annually will occur amongst them; and this is what every stock-farmer believes and expects as a matter of course—a law of nature. But it is also a well-known fact that on certain farms many more deaths occur than on others, influenced, no doubt, greatly by soil, situation, management, and methods of feeding. In some seasons this expected and wonted fatality becomes doubled, tripled, and more. The question then is, What is the cause of this, and what the prevention? One of the chief causes most believe to be, and in all probability correctly, some peculiarity in the season, mild wet winters, want of frost. But then, allowing that either of these is the predisposing and active cause for the time, how does it happen that some extensive farmers even in such seasons escape with little or no more loss than usual? Most probably because their management in summer and autumn had been more adapted to the healthy and steady progress of the sheep, telling favourably for months afterwards. In the treatment of lambs, for instance, one thing which is of great effect towards their living and doing well on turnips during winter is, to keep them in a steady progressive state on grass, but especially to have them so when they leave it for turnips.

Going off grass in thin and poor condition, diarrhœa amongst many of them is almost sure to be produced at once, by the luxuriant tops and juicy nutritious bulbs of the turnip. It is much better when lambs are poor, before folding them on continuously, to allow them for a few weeks at first to go on only so many hours each day, and turn again to grass, however bare, gradually increasing the length of time allowed on the break till it is thought they may with safety be permitted to stay on day and night. By this management I believe turnips not only to be saved, but the flock much more benefited, and their health in a great measure preserved.

When any disease whatever attacks a flock, and day after day one or more fall victims to it, a change of food infallibly proves of very great effect in mitigating its ravages, and finally eradicating it.

Few, I dare say, when they see the flock as a whole feeding and fattening rapidly on a certain field of turnips, care about changing it to another where the chance exists that they might not feed so well; but when two evils are forced upon our choice, it becomes only a matter of consideration or opinion which is the least.

Rock-salt is considered by some as a very good preventive of disease. A good-sized flock will not consume a great quantity of it—many of them perhaps scarcely tasting it. Some, however, seem to relish it exceedingly, again and again walking forward to the troughs and licking and nibbling at the pieces they contain. Such may be incited to do so by a natural instinctive craving to replace a want of salt in the blood, which, when not thus or otherwise supplied to them, may be one of the causes of disease. Be that as it may, salt does no harm, costs little, and very probably promotes heelth to the sheep that use it, especially to hoggs, which, feeding very rapidly in very mild, warm, spring weather, are pre-disposed to inflammatory fever, of something of the same type that attacks yearling calves, or indeed even more quickly fatal. As this is a disease amongst sheep that I have not heard of as having yet become general, it may be as well to say here a few words about it. I have rarely seen it attack any kind of sheep but hoggs on cut swedes, which were feeding unsually fast, during unseasonably mild, sunny, warm weather, and hoggs which had newly lost their fleeces in unseasonably cold weather. So rapidly does it prove fatal, that it is often difficult for the shepherd to prevent those affected with this disease from dying in the blood. The flock may seem all well, and within a very few hours after one of its number be found lying dead, almost in the natural position as when resting, with a little bloody froth about the mouth and nostrils. Such has even occurred through the day, with a man waiting upon them. On skinning those that have thus died, spots, or it may be whole quarters, are found to be in a gangrenous condition; an effusion of black blood, intermixed with small bladders of gas, having taken place in the *facia*, betwixt the skin and the flesh. When it has cut off one of a flock, a few more may assuredly be expected to follow, unless preventive measures are at once adopted; the most effectual of which will be found to be a run off to grass, and fewer turnips given for a time. At such a crisis, supplying them with rock-salt may have—indeed, I almost believe from what I have witnessed, has—beneficial effect, without lessening the turnips, or running off to grass. But still I would strenuously advocate in this, as in the generality of diseases affecting sheep, a change, as the safest, surest, and most simple of all preventives. Change of situation, change of field, change of food—in short, change of any kind that may be and is within the reach of any sheep-farmer, together with keeping them always in a steadily progressive, healthy, improving condition, and not half-starving them one day, week, or month, and over-feeding the next, are, I feel convinced, not only the surest means of prevention of disease amongst sheep, that can be used, but also much the most profitable method as to the feeding of them, believing as I do that variety, as well as quantity and quality, of food has much to do with the celerity of their fattening and increase of weight. Of course, as already remarked, even under the best of management cases of disease will occur, and must be looked for. As to such, in conclusion, I again reiterate as my opinion, formed from observation, if they are sheep with any amount of mutton on them, it is much more profitable never to attempt a cure at all, as nine out of ten are almost certain to die in the blood ere medical treatment, be it good or bad, can take effect, and the whole lost; and, therefore, much better to abstract the blood as soon as signs of disease are discovered, ere the mutton gets greatly deteriorated, and sell it for what it will bring.—Journal of Agriculture.

SOME MORE MR. SMITHS—A WORD IN SEASON.

"A gentleman of the name of Smith" is a standing joke. People titter as he is announced, and say facetiously they have heard of him before, when they are introduced. His whole life through is one long struggle to establish his identity; while his friends are never quite sure of their man till they see him, and the very girl of his heart hesitates ere she hopelessly loses herself in the crowd and confusion of all those other Mrs. Smiths. And yet there are men, even in our own times, when *the Directory* pages the family almost in despair, and the village postman pauses in the delivery of a letter—there are able men amongst us, who would make themselves known and famous even by so unpromising a title. If, like Byron, we wanted a hero, Sir Harry Smith, adorned with all the attributes of true courage and well-won reputation, comes at once to our relief. Or, if more easily content with a pleasant companion and the best of neighbours, who could compare with that most genial of wits and straightforward of parsons, the Reverend Sidney? Try another cast, and we have but to join in with all the rest of the world in singing the requiem of that mightiest of hunters, Mr. Assheton Smith. Albert Smith still flourishes on the stage as the most perfect exponent of a certain sort of entertainment. "Joe Smith" is all but worshipped by thousands of his deluded followers; and Smith "of here," or Smith "of there," is the best man of business, or the biggest rascal, as the case may be, that you or I have the pleasure of being acquainted with.

It would be strange, indeed, if in such a distribution of favours, agriculture could not claim a Smith or two of her own. To Smith of Deanston, in fact, she still owes much grateful remembrance; for more than half a century have the Smiths of Peasenhall supplied her with the best of drills and distributors, as to other Smiths she turns for sheep and shorhorns. But we may not be satisfied even with such Smiths as these, and an exploring party has been commissioned to see if there are any more of them. The venture has already been crowned with the most signal success. Another Smith has been recently discovered, certainly in rather an unknown region; and on the day following, a further specimen was found within more easy reach. To the London Farmers' Club the credit of this enterprise is chiefly due. A carefully selected deputation was appointed to ascertain how and in what way the gentlemen report said so much of really distinguished themselves from their fellow-Smiths. The members on whom this responsible duty devolved were Mr. L. A. Coussmaker, the Chairman of the year; Mr. Owen Wallis, of Overstone, an ex-Chairman; Mr. Thomas, of Bletsoe, the President of the past year; Mr. Charles Howard, of Biddenham; Mr. W. Shaw, of Far Coton; Mr. Spencer Skelton, Mr. W. Gray, and Mr. Henry Corbet, the Secretary of the Club. It is only right to say here that the mission followed on an invitation from the Reverend S. Smith, of Lois Weedon, to inspect his system of wheat growing. At the May meeting of the Club, Mr. Algernon Clarke gives a paper on this subject, and Mr. Smith was anxious that some other members should judge for themselves as to what he was doing. He added that they should see the wheat in its winter garb, in order that they might better compare it with ordinary cultivation. "Later on I shall be more trim, when the intervals will be scarified, and look too cultivated for the farmer's eye."

Nothing could come more opportune than this kindly challenge. Much as the Lois Weedon system has been talked of, and more still as it has been written of, it is very certain that, so far, the farmers themselves have paid it but little attention. Scientific men like Messrs. Lawes and Gilbert may have felt called upon to test the experiment, and Mr. Algernon Clarke have properly qualified for his essay by parcelling off a plot of land at Long Sutton to the process. To show, however, how comparatively little interest Mr. Smith has excited, even in his own county, we may state that neither Mr. Wallis nor Mr. Shaw, two leading agriculturists in Northamptonshire, had ever visited Lois Weedon until they joined their brother-members of the Club at Blisworth. The great value of the discussion following on Mr. Clarke's opening may now be expected to centre in this visit. It would be altogether unfair here to anticipate the opinions arrived at. But we may, even thus early, and in introduction, as it were, speak to the evident anxiety of Mr. Smith to afford the deputation every information in his power, and to encourage his critics to ask awkward questions. Whatever may come of it, the manner in which the course of inspection was conducted was most straightforward and satisfactory.

In the succeeding month, June, the question of steam-cultivation will once more be under the consideration of the Club, and the very name of Smith again suggested something congenial with the subject. Another Mr. Smith was known to be on another side of Blisworth, and he as readily responded to the call of the Club. Undoubtedly the Woolston will rank hereafter as the more important field-day of the two, and certainly to no one more so than to Mr. Smith himself. To see Smith of Woolston at a meeting, with his redundancy of action, and his vehemence of expression, one might very naturally conclude him to be an enthusiast rather over-riding his hobby. A perusal of his somewhat irate letters in the *Mark-lane Express* and *Bell's Messenger* would only go to confirm such an impression. To judge Mr. Smith and his system fairly, the world must come to him, instead of his going out to the world. The finest proof of what may be done by the application of steam-power to the cultivation of the soil is what Mr. Smith *has* done with it at Woolston. He devised it in the first instance simply to meet his own necessities; and even thus early he has conquered almost every difficulty he had to contend against. His steam cultivator traverses on his own farm, not merely accommodating table lands, but hill and valley, rise and fall, of the most trying nature. Yet everywhere is it alike efficient. From being some of the foulest in the district, his land has become commendable for its cleanness. By being properly worked, at the right season and with sufficient power, it has gradually come into beautiful tilth, alike ready for the influence of the atmosphere, or the further hand of the husbandman. Good crops and economical outlay but tend the more to confirm the success of this energetic man, while neighbours on all sides offer him the most sincere of compliments—that of careful imitation. The highest of our Professors speak to the soundness of his deductions, and the first of our implement makers take up his inventions. Dr. Voëlcker, Consulting Chemist of the Royal Agricultural Society, has recently testified to the improved condition of the soil consequent on the Woolston system of cultivation, and Mr. James Howard, of Bedford, is now in Paris for the purpose of inaugurating the use of Smith's apparatus on the Emperor's farms. Further than this, we never saw practical men more thoroughly *convinced;* and we fancy more than one large occupier in a party of half-a-dozen or so bade Mr. Smith good-bye with an inward determination to go and do likewise.

Such visitations as these do an immensity of good, while they must tend more and more to increase the uses and advantages of the Farmers' Club discussions. This will be evident enough in the two meetings now coming on. It will be not merely the opening addresses that will have authority and experience; neither, indeed, should the inspecting party be those alone especially forearmed. The two Mr. Smiths have very recently issued pamphlets on their several systems. That by the Reverend S. Smith, of Lois Weedon, is called *A Word in Season;* and the other, by Mr. William Smith, of Woolston, appears in the form of a letter on Steam Cultivation, addressed to Mr. Disraeli, as one of the Members for Buckinghamshire. There are few things better timed, or more calculated to set people thinking.

Even if a little out of order, let us add a word to the hospitable welcome the deputation received at Lois Weedon and Woolston, and the provision made for their enjoyment and comfort by their brother members, Mr. Shaw and Mr. Owen Wallis. The only difficulty, indeed, the strangers had to contend with, was the profusion of good things set before them. Luncheons, dinners, and luncheons, followed in such quick succession, until honest Sancho's physician might have fairly ordered them away.

PROGRESS OF AGRICULTURE.—At the dinner of the Irish Society the Lord-Lieutenant said—"The general question of national progress or decay must be gathered from an extensive summary; and, looking upon the condition of Ireland in this point of view, I find that, since the census of 1841—not 20 years ago—there have been reclaimed of waste lands no less than a million and a-half of acres. Half a million of acres have been added to the land actually under tillage—a point where a deficiency for the time was complained of; and with respect to live stock, the value since the period I have named has more than doubled. The quantity itself has fully doubled, and the value, I believe, has increased in a far greater proportion; and what I value still more than even the symmetry or substance of the best Durham or Devons, the best Leicesters or Cotswolds—is that the wages of the people themselves—of those by whose strength and skill this vast amount of animal growth and development, as well as of that varied vegetable produce which sustains man and beast, is produced, and tended and improved, has exhibited at least a corresponding ratio of increase. The Irish labourer is infinitely better fed, better clothed, better tended in sickness, and, I think, under the operation of a recent Act of Parliament, I may say soon, with the same confidence, better housed than he has ever been before. I know there are still higher influences to be brought to bear upon him, and upon all of us, than the bread we are to eat or the raiment we put on; but still I contend that agriculture in our day holds a very high position, when its processes generally have attained to the dignity of a science, and when its daily work corresponds with the best-directed efforts of patriotism and of charity."

THE GROWTH OF FOREST TIMBER.

Sir,—Knowing that the *Mark-lane Express* is a paper circulated through Great Britain and Ireland, I take the liberty of stating to you my opinion on the improvement that may be made in the British Empire by the great landed heritors whose property descends from one generation to another, particularly amongst the noblemen of Scotland and the Highlands, where there are so many thousand acres of land lying waste in rocks, stone, and heather, which is half the year round in snow and rainy weather, where forest-timber would thrive as well as in Norway. Many of our northern nobility for years past have planted thousands of acres of fir and birch on their mountain districts and hills, while other parts have lain bare for centuries that might have been forests of fir and birch at the present time. The Dukes of Argyll and Buccleugh are now reaping the benefit of those plantations which they planted many years ago, and many others that have done so since, both in England and Scotland. Yet there are thousands of acres of hilly lands in the north of England and Scotland, Northumberland, Cumberland, Westmoreland, and Lancashire, that have moorland fit for that purpose, and no other. Places in the Highlands of Scotland, that I knew when a schoolboy were nothing but rock and heather, have now forests of fir and larch growing; and yet thousands of acres now on the mountainous hills are laying waste, though fit for no other purpose. Certainly we must admit that many proprietors have not the means of doing it, and many others not inclined. We must also allow you cannot expect leaseholders to plant where their children can reap no benefit from it. And even in entailed estates it is often the case that many families, through depravity and family quarrels, will destroy what part of the family has done before them, sooner than the next should reap the benefit, in cutting down timber before it comes to maturity: no benefit to the timber or the country. Now, we well know that Norway, on its mountains, with all its snows and cold winters, grows fir, birch, and other timber; that its trade mostly depends upon timber, though there is little fit for ship-building. We know that in the last war with America, in Bonaparte the First's time, there were several large frigates built at the Spey mouth, Aberdeenshire, of Scotch fir: that shows Scotland grows as good fir timber as Norway, giving it time to come to size for the purpose. But few are they that will allow it that time.

Now, the Scotch coopers in the herring trade made their casks, many years ago, from birch and alder; but the timber of that sort has been cut down years ago, and they are obliged to get their birch-timber from Norway for the same purpose and boat-building. So much so, that the coopers in that part are now making their pork-casks for pickled pork to London, out of larch fir that was grown in their own country fifty or sixty years ago. English and Scotch fir is much consumed by coopers for the dry cask bottled-porter trade and soda, for exportation to all parts. Beech-timber, in Buckinghamshire, has been made into staves for the same use.

The Irish coopers, for their provision and butter trade, generally use Quebec staves; but, like the Scotch, they are obliged to get all their wood-hoops from England. It has surprised me that the great landholders, or many who belong as heritors, whose estates went from one part of the family to the other, never introduced copsewood-plantations for that purpose into Ireland or Scotland.

Copsewood, or plantations, mostly grow wild in the parts where they are found. Those produced from nut or seeds of different sorts sow themselves. Where they grow to use, they are mostly planted for the purpose; but none but freeholders would take the interest, and few of them that think of it.

Copsewood-plantations pay as well as any wood plantations, for wood-hoops, hop-poles, and many purposes wanted for farming utility; but fir-wood hoops pay as well in the south—Surrey, Sussex, Kent, and Reading. Almost all the wood-hoops bought by the London hoop-merchants are made in that part from a gallon paint keg to a 30-bushel hogshead of 14 feet to 16 feet long, and many ash stout poles are made into truss-hoops for the London coopers for large work. The Scotch take them for herring-barrels, the Irish for provisions and the butter trade. None makes better casks or butter for exportation to hot climates; their butter fetches in the West India market 1s. 3d. per lb., when the American is sold for 10d. per lb.

Plantations of copsewood, planted regularly for that purpose in Surrey and Sussex, fetch as much per acre as the best arable land in that part. The woods best for that purpose are ash, birch, hazel, China-tree, chesnut, willow, and many others, and, planted at a certain distance, grow far quicker than where they are planted some too thin and some too thick; and what grows too crooked for hoops are made into hurdles or short bundles, hand-sticks, and such-like.

Sixty years ago almost all the London bakers used nothing but firewood from Epping, and all that part. The ship-biscuit bakers and Government Victualling Office bakers from bavins made out of the copsewood from Kent, Surrey, and Essex, grown any way; but now that all the bakers use coal, instead of wood, that kind of copsewood is little worth, only to grub up, except on hilly land not fit for arable or sheep-pasture.

The Emperor of France talks of improving France. One of his propositions is to plant all the hilly lands with wood. Of course the French are more in want of wood for firing than the English, who have plenty of coal. But we must allow that in many parts of Great Britain and Ireland, near the sea-coast, wood will not grow to any advantage, exposed to sea-gales and to sea-atmosphere. Basket-makers, and those in that kind of way, use osiers and willow grown on the banks of the Thames and swampy places; and it pays as well as copsewood in general to freehold heritors.

Norway supplies us with short ends of the fir-trees, cut off their trees, sawn by their water-mills. It is called fathom-wood, being sold by the fathom, and pays little or no duty, and, supplying all London with penny bundles and lucifer-matches, makes a very good market, taking British goods in return; but it shows Norway timber is getting scarce in the deal way, by their deals getting very narrow and very knotty. The brewers in London use all Danzig oak and Memel oak from the back part of Poland. No other timber will suit beer for home use and exportation. Brewers' vats are mostly made from English oak.

In woods for forest timber small seed may be scattered. Hips and haws would be fit to make food and shelter for game of many sorts, particularly in those parts not disturbed by travellers.

An acre of land, that looks small in a mountainous or hilly country, looks much larger on a plain surface.

You can give a lecture in your paper, if it suits your convenience and pleasure, to many large landed proprietors or freeholders who would read a lecture in a public paper, to their advantage, that would not go half a mile to hear one. But many heritors are so fixed with lawyers that they can do neither one thing nor the other. Having nothing further to observe on the subject, I leave it to others to improve.

I remain, your obedient servant,

London in the East. A. Traveller.

CALENDAR OF AGRICULTURE.

The work of the farm now presses hard on the farmer, and requires all the exertion and diligence he can command. The planting of potatoes and beet must be finished early in the month, and of grass seeds, and the hoeing and cleaning of all drilled crops must have constant attention. Sow Swedish turnips, purple and yellow topped, and continue with Aberdeen yellow bullocks as a later sowing. Plant cabbages, savoys, and winter broccoli. Sow rape to be consumed on the ground preparatory for wheat, and sow early white turnips for use in autumn.

Pare and burn lands constantly during this month, and prepare turnip and clay fallows.

All dung heaps must be turned over for ten days before being used, in order that a fermentation may take place: all lumps and large pieces must be carefully broken and shaken out. Watered meadows may now be shut up for hay. Gates and fences must be thoroughly repaired for summer use.

Cattle of all ages may now go to grass; the milch cows in a well watered and sheltered field, and the store cattle will go to the pasture fields, and be arranged according to age. A proper arrangement conduces much to their thriving and well-being. The calves of the year must be similarly arranged, the oldest in a grass paddock provided with water and a shed for shelter, and have one suckling daily, and be supplied with clovers and vetches in racks. The young calves in the pens have green meat given them, in order to accustom them to such food previous to being turned out.

The lambing ewes must be supplied with oats and oilcake in troughs until the early vetches and rye be ready. The food may be cut and given in racks, and part must be carried home for feeding horses, cattle, pigs, and calves in the yards. Litter amply. As the land is cleaned, plough it for a turnip fallow.

Hop grounds are dug in this month, and the bines tied to the poles; young hedges weeded, oak trees cut, and the bark stripped and dried.

Wash sheep by hand in a running stream a week or two before shearing commences. To prevent the maggot fly depositing the eggs on the animals, sprinkle the bodies from head to tail from a dredging box with a mixture of hellebore root powder and black brimstone, ¼lb. to ½lb.

No month in the year brings more business to the farmer than the present, and if he loses ground now, it will rarely be recovered during the following season. The preparation of the turnip and clay fallows are in the critical season: the first crops must be planted, and the rest prepared with the utmost attention and exertion.

CALENDAR OF GARDENING.

Kitchen Garden.

Plant kidney beans, as scarlets and painted lady runners, in warm grounds; as the seeds perish in cold wet soils, and yet the plants do not thrive in dry arid grounds; hence sowing in pots is preferred, and also of dwarf French beans, all being directed by the season and weather. A stock of beans in pots is useful in the spring month, and open sowings may be done in summer.

Sow peas, as Knight's marrow, and Adamson's matchless, a fine Dorset variety. Trench the ground a foot in depth, and mix with compost or very rotten animal dung in the lower spit. Water profusely, fill up the hole, and raise a high ridge in the centre. Water again in a few days, and when the ground is dry, sow the peas in rows. This mode secures against mildew, and will raise peas in good crops up to Michaelmas.

Plant potatoes for late crops, range the rows north and south where practicable, to admit an equable diffusion of sunlight.

Flower Garden.

Flowers are not much done with till the middle or end of the month. Groups of mixed plants may be planted in beds and parterres. Pelargoniums and verbenas, and other delicate beauties, are well displayed; but as an hour's frost often destroys whole collections, no final regulation can be done till the end of the month.

DEEP CULTIVATION OF THE SOIL.

No marvel that my idea of ridiculing draining the land, and advocating deep cultivation in its stead, should meet with dissent, as the necessity of the former has been a settled question long since; but as the subject is admitted a reasonable argument by some of the most distinguished agriculturists, and that a principle may not be correct, though substantiated, allow my freedom in furthering my views on the subject.

Not only is deep cultivated soil, whether by steam power or manual labour, conducive to greater productiveness from its aërefactory or evaporating powers, and its capability of receiving and retaining and also giving off all the rain and dews which old dame Nature receives and refuses to retain, but crops growing on such soils are to a certain degree favourably influenced by it, and are also much less liable to the ill effects of severe frosts, and are of more early renovation after winter than on lands cultivated fleetly by horses and the common plough. An exemplification of this truth was noticed particularly in a field of mine quite by chance about thirty years ago, when a very severe frost occurred in Suffolk on the night of the 29th of May, such an one as I never before or after witnessed so late, cutting-off and blackening all the nettles by roadsides, and many of the potatoes and French beans in gardens after they were moulded up, and nearly all in the fields which were growing under shallow cultivation. All crops that year were very forward, and I had about an acre of dwarf French beans in full splendour; but the whole were completely blackened and destroyed on that memorable night, with the exception of one solitary spot fully exposed, of only a few yards square, which to my own and my neighbours' surprise were not at all injured by the frost.

This curious circumstance induced me to ascertain the cause by a research, imagining it attributable to something subterranean. To my surprise and delight, at about two spades deep was deposited a hidden treasure of several thousands of new tiles, which had evidently been hidden there to escape the eye of the excise officer, as the property had formerly been a brick-yard. I, and many others, concluded the cause to be perfect drainage which prevented the frost and spared the crop; but experience since, in similar matters, has proved the contrary, and that it was not so much percolation or drainage, but its receptive powers of all atmospheric moisture and quick aëration or evaporation afterwards, as this very spot, from its loose subsoil, was subjected to the absorption of all the rains and snow falling upon it, and its being without drains to carry off excessive moisture.

Many similar circumstances have attracted my notice since, fully corroborating deep cultivation to be of much greater consequence to obtain superior and enhanced produce of the soil, than all the draining which ever was or ever will be performed on ordinary soils, except on those which have been hitherto drained, where those old drains are often bursting and overflowing, and which must necessarily be re-drained, or the worst of consequences may follow, and on such lands as are naturally springy or of a hydropical character, and on a whole are by far the least in area in most localities.

ABRAHAM HARDY,
Seedgrower, &c.

Maldon, Essex.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR APRIL.

The unusually cold weather experienced during nearly the whole of the month has retarded the progress of vegetation throughout the Kingdom, and the extreme backwardness of the season has given rise to serious apprehensions in many quarters in reference to the fate of our live stock. Already, hay—the consumption of which is very large—has risen considerably in price, and the bulk of last year's growth has been consumed in the grazing districts. Both beasts and sheep have ruled high in price, and the progress of feeding has been a most expensive and unsatisfactory one. As regards the appearance of the wheat crop, we may observe that it is anything but favourable. It would, however, be premature to hazard any positive opinion in reference to the forthcoming crop from the present backward state of the plant, which, otherwise, does not exhibit an unfavourable appearance. The sowing of Lent corn has been pretty generally concluded, but at a much later period than usual, owing to the saturated condition of the soil.

The wheat trade has been considerably firmer than for many months past, and an advance of from 3s. to 5s. per quarter has taken place in the quotations. The comparative activity in the demand has resulted more from a demand having sprung up at Mark-lane for consumption in Ireland than from any other cause. The quantity of wheat, wholly English, taken for that country has not exceeded 1,000 quarters; nevertheless, the purchases have been sufficiently large to give an improved tone to the market, although it is presumed that they have been effected solely for speculative purposes, and in order to enhance the value of some heavy stocks held in Dublin, Cork, &c., by wealthy houses. That the advance here referred to is likely to be supported, is pretty evident from the present position of the trade. In most of the continental markets, produce, generally, is commanding extreme rates—there is next to nothing in progress of shipment from America—and the stocks of foreign grain in our warehouses are now much reduced. No doubt, we shall shortly receive liberal supplies from abroad; but it may be well doubted whether they will be sufficiently extensive to have any depressing influence upon present quotations. There has been considerable firmness in the inquiry for all descriptions of spring corn, especially for fine barley and oats, at extreme rates; but, with the exception of wheat, the fluctuations in grain have been trifling. English wheat is still held in fair average abundance; but the supplies of all other articles have become very limited. We shall, therefore, be chiefly dependent upon the foreign growers for arrivals of spring corn during the remainder of the season.

The late advance in the value of money in the discount market has had considerable influence upon the wool trade. At the public sales of colonial held at Liverpool prices have given way 2d. per lb., and in the metropolis English qualities have given way 0½d. per lb. Manufacturers, generally, complain that they are unable to obtain prices for their woollens corresponding to the present high value of the raw material; hence they have for some time past purchased for immediate use only. This state of things, and the limited state of the export demand, together with the announcement that over 72,000 bales will be offered at the next series of wool sales appointed to commence on the 3rd of May, induce the opinion in many quarters—especially as the quotations have given way in Australia—that prices have seen their highest range. The efforts made for some time past to establish colonial wool sales both in France and Holland—though, as yet, only partially successful—must of necessity have some influence upon the demand.

Notwithstanding that most unfavourable accounts have from time to time reached us on the subject of the potato disease, the arrivals of potatoes into London, coastwise and by land-carriage, have been seasonably good, and certainly in improved condition. Prices have ruled high, however, viz., from 80s. to fully 160s. per ton; but they are considerably beneath those anticipated by the growers in the early part of the year. On the Continent the stocks are much reduced; still, a few parcels have arrived in London and at the outports from that quarter.

The demand for hay has been active, at enhanced quotations. The best meadow has realized £5, the best clover £5 17s. 6d., and the best straw £1 14s. per load. Large supplies of the former have been purchased in London for consumption in the midland districts.

The stocks of home-grown wheat, barley, and oats, both in

Ireland and Scotland, have become much reduced. The trade, generally—in the absence of any supplies of importance from abroad—has ruled healthy, and prices have somewhat improved; but the trade has not been to say active. The shipments to England have been smaller than in many previous months, and we believe that they will continue limited for some time.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Owing to the backward state of vegetation, and the scarcity of food in nearly all parts of England, increased supplies of both beasts and sheep have been on offer in nearly the whole of our leading markets held during the month. Their general condition, however, has proved inferior: hence, the actual weight of meat disposed of has not shown any important excess, when compared with most previous corresponding periods of the year. The enormous amount of consumption going on has produced much firmness in the demand; prices have continued to rule high; and the trade generally has ruled healthy. From various localities reports have reached us to the effect that the scarcity of stock has become more than ever apparent. We are so much accustomed to these statements, that we naturally regard them with some amount of distrust. There is, however, one thing certain—viz., that production is not keeping pace with consumption. When we consider that the trade and commerce of the United Kingdom are in a highly flourishing state, notwithstanding the high range in the value of money, and that the demand for stock is likely to continue active during the whole of the present year, it is clearly apparent to our minds that meat will long rule very high in price, not only here, but throughout the continent. We may import largely from Holland and Germany; but even our present quotations will, we imagine, fail to secure for us such an increase in the supply of food as shall produce an important downward movement in price. For some years past, we have received steady importations of both beasts and sheep from Ireland; but we now seem, at least for a time, to have arrived at a reversed order of things. During the past fortnight, several lots of sheep have been purchased in the Metropolitan Market for consumption in Dublin and Liverpool, which markets have drawn largely from sources which, at this period of the year, usually supply the Metropolis. The effect upon the live trade has not been to say important; but in the dead markets, as much as *five shillings* per 8lbs. has been paid for prime mutton. This is the highest quotation known for a considerable period; and it proves that there is a decided scarcity of the most valuable or selling breeds of sheep in the country. The only arrivals from Ireland, since we last wrote, have been 72 oxen and heifers; and, from information derived from reliable sources, the receipts during the next two or three months will be on a very limited scale. At present, be it observed, there is no want of supply; but we may rest assured that, when pasture-food becomes plentiful, there will be a considerable falling-off in the arrivals, and that really prime stock will be very high in price. Although the weather has been very unseasonable, lambs have realized quotations in advance of last year, although it is admitted that the "fall" has been a full average one, and that very few losses, in a comparative sense, have been experienced.

The importers of, and dealers in, tallow—owing to the continued high value of that article, the result, in a great measure; of a combination amongst Russian holders—have shown no little anxiety to ascertain the probable amount of fat which they will be able to purchase during the remainder of the year. The supply, of course, must ever regulate the value of the commodity; but as far as our judgment carries us, there is no prospect of such an increase in it as will have the effect of reducing the quotations much beneath their present level. This is an important matter for consideration on the part of our breeders and feeders, because, as a matter of course, the quotation of "rough" fat in the market enters into the value of live stock, possibly to a greater extent than is generally supposed. At present, that commodity is quoted at 2s. 11½d. per 8lbs., or a decline of 2½d. from the highest point. This quotation, however, which represents the value of some kinds of meat in periods of comparative abundance, is, however, calculated to check the demand, and compel the public to use substitutes of a less expensive nature, such as gas and oils, for household purposes. We believe, therefore, that the tallow trade has seen its best days, and, no doubt, prices will be lower when the present monopoly is destroyed, and when the 20,000 casks held during the winter at St. Petersburg are shipped to this country, in addition to the usual supplies.

The annexed return shows the importations of foreign stock into London in the course of the month:

	HEAD.
Beasts	835
Sheep	8,733
Lambs	3
Calves	800
Pigs	118
Total	10,489
Same time in 1859	8,888
" 1858	5,998
" 1857	4,814
" 1856	1,924
" 1855	4,253
" 1854	4,760
" 1853	14,787
" 1852	5,444

From the above, it will be seen that the importations have been on a full average scale; but we may observe that the sheep have chiefly consisted of very inferior stock produced in Germany, and shipped *via* Hamburg; hence the addition to our supply of food has been trifling.

The total supplies of home and foreign stock exhibited in the Metropolitan Market have been as under:

	HEAD.
Beasts	18,512
Cows	489
Sheep and lambs	114,450
Calves	1,848
Pigs	2,140

COMPARISON OF SUPPLIES.

April.	Beasts.	Cows.	Sheep&Lambs.	Calves.	Pigs.
1859......	16,850	390	110,114	420	1,990
1858......	17,950	400	104,380	1,332	2,097
1857......	18,601	460	92,810	1,240	2,025

Last month's arrivals of beasts from Norfolk, Suffolk, Essex, and Cambridgeshire amounted to 14,000 Scots, crosses, and Shorthorns; from other parts of England, 2,100 various breeds; from Scotland, 600 Scots and crosses; and from Ireland, 72 oxen, &c.

Beef has changed hands at from 3s. 4d. to 4s. 10d., in some instances at 5s.; mutton in the wool 3s. 8d. to 5s. 10d., out of the wool 3s. to 5s.; lamb, 5s. 6d. to 7s. 8d.; veal, 4s. 8d. to 6s.; pork, 3s. 6d. to 4s. 10d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	April, 1857.						April, 1858.				
	s.	d.		s.	d.		s.	d.		s.	d.
Beef, from..........	3	4	to	5	0	...	2	10	to	4	2
Mutton	4	6		6	2	....	3	0		5	0
Lamb..............	5	10		7	4	....	6	0		7	0
Veal	3	8		5	10	....	4	0		5	4
Pork	3	8		5	0	....	3	0		4	4

	April, 1859.				
	s.	d.		s.	d.
Beef, from	3	4	to	5	2
Mutton	3	6		6	0
Lamb.................	5	4		7	0
Veal	3	10		5	8
Pork	3	0		4	2

The health of the stock in most of our breeding counties has been tolerably good, notwithstanding the shortness of keep.

Newgate and Leadenhall have been fairly supplied with town and country-killed meat, which has sold irregularly, at the annexed quotations:

	s.	d.		s.	d.
Beef, from	2	6	to	4	4
Mutton	3	6		5	0
Lamb	5	4		6	6
Veal	4	4		5	4
Pork	3	8		5	0

Per 8lbs. by the carcase.

DERBYSHIRE.

We are passing over a very trying period of the year. On every side we hear complaints of want of food for stock. It has truly been a long winter, and the early demand on winter food, together with the extreme severity of the season, has brought all kinds of provender to a high point. Hay stacks are scarce affairs; and pieces in many places wanting. The aspect of the country is that of more sterility than the time of the year warrants; and grass in early districts is backward. Farm work is sadly behind. The season has been too wet; and those who have been restless, and urged it along, have, in many instances, done more harm than good, poaching the ground, and leaving a very poor seed bed, with a prospect of an indifferent return. We hold it a universal axiom never to sow until we have a good tilth. Better never sow at all than run the chance of a half crop. Vegetation in all its forms is backward, and needing sunshine. The wheat plant is much behind, and on all wet soils has a very starved meagre appearance. On clay soils, where drained, none too good: many of the plants have perished from the severity of the winter, and are what the farmers call thrown out. Several fields we have seen that were sown in February promised better than that put in in the autumn. Taken as a whole, the crop as at present is very indifferent, and must apparently come short at harvest. We hope there is a brighter aspect in reserve for us. One remark we would make as to the remedy applied to the sickly plants. Several farmers are rolling the fields, to give solidity to the ground, and fasten the plants. Now, we think it most destructive to all, even healthy plants. We think an observant mind will easily perceive that whatever power is applied to the roller is equally resisted by the soil; and if any one will watch the movement of the loose earth when the roller is in motion, he will see that the soil, and all attached to it, moves several inches; so that the inference is plain. The roots of the plants are broken, and immense damage done instead of good. As a rule, no plant ought ever to have a roller pass over it. We rather advise harrowing with thick tedded harrows (many teeth), so that the surface, and nothing more, may be perfectly disturbed. Or hoeing, the hoer always moving backward while in the act of doing so. Or a good flock of sheep folded, giving them plenty of linseed cake at the same time. In spite of the immense loss sustained from the frost in winter to the mangold wurtzel, the farmers are making preparation for another spec. More care will be taken another season. The rod applied has been heavy enough. They would now be invaluable to us if we had them. Our cattle markets and fairs are dull ones for stores. Fat stock is in good demand, and must rise in value. Sheep sold well in price, considering the scarcity of keep. The lambing season has been a trying one, and considerable loss has been sustained in some districts, from the weakly state of the ewes, and the severity of the season. All kinds of grain steadily creeps up in value, wheat taking the lead. The quantity of old wheat on hand is still considerable, or the upward move would have been greater. The demand for labour is on the increase, and in many localities it is next to impossible to get a good servant. The working people bid fair, at last, to form a class demanding a voice in the legislation of their country. Wages from 15s, to 20s. per week.—*April 18th*, 1860.

ISLE OF ELY.

The cold weather still lingers. After six months of genuine winter, we had anxiously looked for a mild and genial spring, but it is yet future. Cold winds and frosty nights have generally prevailed, with only a mild day occasionally to break the monotony of the cold. To-day we have an east wind, with a higher temperature; but there are indications of a return to frost and cold again ere many hours have passed. The season is decidedly backward, and vegetation has made but little progress. The hedges are only just breaking into leaf, and the trees are yet destitute of foliage. But notwithstanding the lateness of the season, we cannot report unfavourably of the growing wheats generally. On our best farmed and strongest fen soils the wheat plant is looking healthy and promising, and, where early rolled, is growing strong and vigorous, although backward. On some of the weak and naturally unkind fen lands the plant is looking very thin and sickly, and can scarcely make a crop, however favourable the weather may come. Some of the gravelly high lands, too, are not quite as promising as they were; they are turning a little pale in colour, arising from the hardness of the surface. The heavy rains of the winter, followed by strong penetrating winds, have occasioned the soil to get as hard as a road, and the wheat is suffering. We are harrowing acres to break this hard crust, and make the land again susceptible of benefit from atmospheric influences. Most of our farmers are getting their lands prepared for mangolds, but many of them still obstinately refuse to sow this crop before the very end of the present, or the beginning of the following month, notwithstanding the many remonstrances and kind rebukes they have received. Potatoes are nearly all planted, but the growth this year will be smaller than usual. Oat-sowing is about completed; many of the first sown are up and looking healthy and well, although growing slowly. Beans and peas are also showing themselves very generally. Last year, at this time, we were hoeing peas; such is the difference in the seasons! Grass on good dry lands is growing, and our earliest pastures now look beautiful, and are quite big enough for sheep; warm nights and frequent showers are required to make the bullock pastures good. Store stock of all sorts are a slow sale; prices move up very tardily, and it will only be when grass is plentiful that they will rally, and then we expect, as we stated last month, a decided reaction. The corn trade is improving, and wheat has advanced considerably, but not more than we anticipated; prices must yet be higher. All feeding stuffs are high, with a brisk demand. Meat must sell well, to pay for all this, or our graziers will suffer.—April 16.

NORTH NORTHUMBERLAND.

We have deferred reporting from the most northerly corner of England, hoping long ere now to announce the advent of spring, so anxiously looked for by the rural population at this advanced period of the season; still it has been willed by a wise overruling Providence that "winter lingers in the shades of summer," inasmuch that to this day scarcely a green herb appears. Nor for some time past has the sweet melody of the singing bird been heard. A bitter north-easterly wind has been the prevailing element for several days past, and everywhere the bleating of sheep and lowing of beeves meet the ear. Provender of all sorts being extremely scarce, it is no easy matter for the flockmaster to meet the cravings of the appetite. In the lower districts there have already been many losses from starvation among the tender ewe and lamb hirsels. On the mountain grazings the casualties are still more numerous. The present month being the principal lambing season, when we look at the entire range of our border mountains lying under an icy mass of snow for the past six months, no one can doubt the loss and impoverished state of the fleecy tribe. No season within our recollection during the present century did winter visit us with his hoary locks before our usual autumn quarter, maintain a fixed hold of his sceptre during his dark and dreary months, and smother vernal spring until the powerful heat of the sun's rays shall melt away his briny icicles. While we write, the team works in the field, preparing a seed bed for turnip-sowing, and the men following in full winter clothing, sea running mountains high, with drifts of snow at intervals. On the other hand, farm labour is well forward; spring seeding nearly completed, and the finish generally satisfactory. Oats and barley, where early got in on old ploughed land, had a well pulverized mould, and are making braird; but nothing can be said of progress. Barley, where prematurely sown, will suffer severely from the frost. Wheat lands seeded in the foggy days of December look miserably thin; what was down the last week in February has brairded much better; the breadth sown altogether will fall far short of the average of seasons. Autumn-sown wheats have made little progress on our greatest breadths; cannot be seen without close inspection; yet generally seem well planted; the land loose, and much hoven by the severe winter frost. Clovers and grass seeds only partially sown on such fields, awaiting dry genial weather, when the harrow works safely without hoeing up tender plants. Of barley a large breadth has been sown; and oats a full medium. Potato planting has been going forward on dry soils for some days past, with not very favourable aspect for vegetating, the soil working cold and clammy below the drill. Next in importance are our corn and cattle markets, which now seem to be creeping up for want of supplies. Many auctions of grazing parks let annually for the season; they have generally been knocked down at fabulous prices per acre; dire necessity causing the mountain flockmasters to take the field at any price, which has proved quite "a windfall" to the lucky owners of grass lands. Our provincial papers display immense numbers of May and June sales of farm stock, where parties have been superseded. We hope a more genial atmosphere will afford a prospect of herbage, and give heart to intending purchasers, present appearances being far from cheering.—April 20.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BANBURY FAIR.—There was a good supply of beef from 4s. to 4s. 8d. per 8lbs., while mutton was dearer, the best qualities fetching as much as 5s. to 5s. 6d. per 8lbs. without the wool.

BEDFORD ST. LEONARD'S FAIR, (Saturday last.)—The show of stock was large, of sheep about the usual average. Horses not in great number; altogether trade not so good as at Luton fair on the Monday previous. Prices asked for store beasts and sheep too high for purchasers—hence many were left unsold, the late spring making many graziers indifferent as to purchasing. Cows and heifers less sought after through the same cause. Horses of good size and usefulness found buyers at high figures. Best store beasts, Hereford and short-horns, from £11 to £13 each; Scotch ditto £9 to £10 each; cows, best from £15 to £18 each, heifers at from £12 to £14 each; Sheep, best half-bred tegs at from 34s. to 36s. each, ewe and lamb from 40s. to 46s.; wethers (fat) made 5s. per stone, fat ewes 4s. 4d., fat beasts from 4s. 4d. to 4s. 8d.; best riding and driving horses 40s. to 45s. each, others at from £20 to £30; ponies £9 to £16 each; cart horses from £25 up to £40 each.

CHESTER FAIR.—There was a good show of horses: many splendid animals were exhibited, but as business was dull, which may be accounted for in a great measure by fodder being very dear, in consequence of its scarcity. The cattle fair was thinly attended, and business anything but brisk.

CLENT HOLY CROSS FAIR showed more animation than usual; there was a large attendance of buyers, and the stock exhibited were good. Couples realized from 50s. to 60s.; fat sheep, 8½d. to 9d.; fat cows from 6½d. to 7d.; cows and calves, from £11 to £19; other stock and pigs sold well.

CLIFTON-ON-TEME FAIR.—There was a tolerably good supply of fat beasts, which sold at about 6½d. per lb., but only a few store cattle and sheep, which were not much sought for, owing to the shortness of keep. Pigs but few, and those sold at the same prices as of late.

CROWLE FORTNIGHTLY MARKET.—Beasts appeared to be very little enquired for, and a limited amount of business was transacted. Pigs were very dear.

EVESHAM FAIR.—There was a good attendance, and business was rather brisk. Stock generally of middling quality, and no great supply. Cows realized on the average about 15*l.*; store heifers from 11*l.* to 16*l.*; beef made 6½d. to 7d. Sheep fetched about 3*l.*; mutton, 8d. to 8½d. in the wool, and 7d. to 7½d. shorn. Pigs sold at about 10s. 6d. per score. Horses, moderate supply.

GLOUCESTER MONTHLY MARKET.—The supply of stock and beef was shorter than we have witnessed at this season for many years. There were very few sheep, and those were sold at extremely high rates. The market closed very early, with a clearance at the following rates: Beef, from 6¾d. to 7d.; mutton, from 8d. to 8½d. per lb.

HOWDEN FAIR.—First-rate horses were scarce, and realized advanced prices; inferior plentiful, but a slow sale. In fat cattle a good sale was effected at an advance; lean could not be disposed of, even at a reduction.

KINGTON FAIR.—The supply was as abundant as on any former occasion; and, notwithstanding the scarcity of keep, there were to be seen some very fine cattle. There was also a good attendance of dealers The demand for stock of an average quality was also much better than was anticipated, and a fair number changed owners at much better prices than was expected. The supply of sheep was but small, and the demand not over brisk. On the whole the fair was a very good one.

LAUNCESTON FAIR was scantily supplied with good grazing beasts. The severity of the season was very apparent in the condition of the greater portion of the cattle. The sale for the best stock was tolerably good, but that out of condition quite neglected. There was a good show of fat beef, which sold at 60s. to 65s. per cwt. Fat sheep were scarce at 8½d. per lb., but couples were a large supply; being much out of condition the sale was dull in the extreme. The weather being exceedingly cold, and vegetation so very backward, with the winter fodder nearly (in some instances completely) eaten up, the stockmaster is put to his wits' end to keep his flocks and herds from starving.

LOCKERBY FAIR.—There was a larger show of sheep than last year: the stock comprised 2,260 head. There was a goodly number of intending buyers present, and there was a fair demand for half-breds, but owing to the unfavourable markets at House of Muir, they were generally offering 2s. to 3s. less than buyers inclined to accept, and the market was slow for that description of stock. The great number of deaths already among Cheviot ewes, and the prospect of an increased mortality during the hill lambing season being certain to cause many blanks in breeding flocks, which will require to be filled up by gimmers, there was a good demand for that description of stock, which were realising in most cases prices similar to those of last year, though in few instances was the condition equal. Cheviot wedders were less in request than gimmers. There was a considerable number of cattle, comprising all kinds, and in many cases the prominent bones of the animals showed that fodder was at a premium. Mr. Jardine bought a bullock at £22. Mr. Irving, of Whitehill, sold a three-year-old pure bred Ayrshire bullock at £22. There were few good Ayrshire cows shown. Mr. Hetherington bought several of the best from £12 downwards.

LUTON FAIR.—There was a good demand for beasts at advanced prices of from 5s. up to 20s. each. Fat beasts sold readily. Every horse worth notice sold at high prices. Fat wether sheep were disposed of readily; other descriptions were not so much sought after. Fat pigs sold at the prices quoted at Leighton Buzzard fair last week.

NEWTON-STEWART MARKET. — Extremely high prices were being asked, which, together with the scarcity of fodder in the district, made buyers very shy, and at two o'clock there had been no sales effected. Of pigs there were several carts on the stance, and prices ranged from 10s. to 14s. each, according to age and quality.

SHIPSTON-ON-STOUR FAIR was numerously attended by dealers, and there was a good show of useful horses, which were offered at prices varying from 25 to 55 guineas; there was also a good supply of beef and mutton, which met with a ready sale; beef, 7d. to 7½d.; mutton (shorn), 6½d. to 7½d. A full fair of tegs and stores, with a dull trade, owing to the shortness of keep; on the whole, a considerable trade was done.

STROOD SHEEP AND CATTLE FAIR.—The show of sheep was very large; there was also a good supply of horses for agricultural purposes; few beasts and calves. Trade was brisk, and very firm; the total number of sheep penned being 6,152. This large supply of sheep is mainly owing to the want of keep; the highest price for Kent tegs was 44s.; and half-bred tegs 45s. was asked and refused, and they were eventually cleared at 43s. per head; other sheep varied from 30s. to 40s. The average price for four and five years old horses was from £30 to £50. At the close of the fair all the sheep were sold, and nearly every horse and beast. The stock of beasts were very lean, but everything sold well. The attendance of farmers was considerable from all parts of Kent.

TEWKESBURY FAIR was very well attended. The supply of cattle was about the same as usual at this time of the year. Mutton, out of the wool, sold at 7d.; and in the wool at 8d. per lb. Beef sold at from 7d. to 7½d.

WAREHAM FAIR was fully attended. There was a large supply of stock, but the scarcity of keep prevented much of it from changing hands.

WORCESTER FAIR.—There was a very large supply and a brisk trade. Beef of good quality averaged 7d. per lb. A short supply of mutton, and of middling quality; in the wool at 9d., and shorn at 7½d. to 8d. per lb. Stores very dear. Sheep and cows all sold; plenty of buyers for all kinds of stock.

IRISH FAIRS.—Drogheda: There was a large show of store cattle, and anything approaching primeness in quality met a fair demand. Good beef went to 65s. per cwt., and in some instances 1s. more. In stores, three-year-old heifers brought from £8 to £12 5s. each; two-year-olds averaged £8 each; yearlings from £3 to £5 10s. per head. Some good lots of wedders brought from 57s. 6d. to 65s. each; hoggets averaged 45s. each. The pig fair was largely supplied, and a good deal of business was done. Cappawhite: There was a firm demand for good stock. Springers were much sought for, at rates ranging from £7 to £12. There was a moderate show of store sheep, which brought from 33s. to 40s. each. Fat pigs rated at 48s. to 50s. per cwt., but the supply was scarce, the sales being chiefly confined to stores. Bansha: High prices were obtained for fat cattle and sheep, but the supply of each kind was very limited. Beef realized fully 55s. to 60s. per cwt.; store hoggets, 36s. to 42s. each. Ennis: The supply was larger than was expected; good beef cattle in good demand. No fat sheep, but those in forward condition commanded very high prices: the average for good useful in-calf heifers was £13 each. There was a fair inquiry for those in condition, but a large number of others left unsold.

REVIEW OF THE CORN TRADE

DURING THE PAST MONTH.

April has had but few of its characteristics. There have, indeed, been showers and sunshine; but the temperature has been below par; and after such a prolonged season of cold, the sharp night frosts and cutting winds that have prevailed have been very disappointing. But little progress has been made in the growth of the spring wheat, even in the best cultivated and most eligible soils, and as the long prevalence of low prices had seriously discouraged the cultivation of this grain, we cannot look for more than an average crop under the most favourable circumstances; while backwardness and many failures in the light lands and wet clays scarcely permit this moderate expectation. It is true there is yet time for a favourable change; but the failures of last season have brought out the unwelcome fact, that stocks are universally short in Europe, and this country is the undoubted exception that old stores still remain good. The crop last year in Ireland has turned out so deficient, that several country markets have been fairly without supplies, and this being often repeated, has opened the eyes of all interested as to the real state of things, and at last brought about an increase in the value of wheat of 2s. to 3s. per qr. in the course of the month throughout the United Kingdom. It has been doubted by some whether the advance will be maintained; but when it is considered that the price of wheat is yet moderate, and that not only Ireland, but Portugal, Spain, and Italy, all had seriously deficient harvests, while France, Belgium, and Holland were also below an average, the probability seems rather in favour of a further rise than otherwise. The imports into London during the last quarter show a decrease as compared with 1859, of 84,843 qrs. wheat, 31,784 sacks 30,657 brls. flour. The state, too, of the wheat trade had been so discouraging to importers, that the stock of really good wheat in London was brought down to between 40,000 to 50,000 qrs.; and though inferior qualities might reach to 150,000 qrs. more, what is this to a population of nearly 3,000,000 souls, but a supply for three or four weeks? Our anticipations of last month have therefore been fully realized, and we now look rather for a further advance than a return to the low prices lately ruling, there being no port in the world, either foreign or English, overburdened. Nor has wheat alone been influenced by the changed aspect of affairs. Spring corn has likewise risen in value from the prevalence of ungenial weather, very few of the meadows yet showing any quantity of grass, and, as a consequence, stock has seriously suffered, not only in the northern parts of the island from the severity of the season, but by the failure of fodder in the midland and southern counties; so that, all things considered, low prices, either in breadstuffs or meat, seem distant. The following quotations from foreign ports will show the value of wheat abroad, as well as the probability of imports.

The French markets, though improving slowly before the rise in England, have been chiefly stimulated by the change in this country. The best wheat at Paris was worth 56s. per qr. At Nantes 41s. per sack of 280 lbs. had been paid for flour, and 43s. was subsequently demanded. At Louvain 62 to 63 lbs. per bushel wheat had sold at 54s.: at Ghent as much as 56s. per qr. was paid. 62 lbs. wheat at Groningen brought 52s. 6d. per qr. The quotation at Cologne for fine wheat was 53s. per qr. Sales at Hamburg had been made of fine red for England at 53s. to 54s. per qr., freight included. High-mixed at Danzig had been sold, freight included, at 58s. per qr. Fine wheat at Konigsburg was worth 52s. per qr. At Riga 48s. per qr. was demanded for good red quality. Good soft wheat at Odessa was sold at 43s. to 45s. per qr. Native wheat at Naples sold at 53s. per qr. Berdianski at Genoa was worth 52s. per qr. Prices in Spain continued very irregular, and since the late rains were more moderate. Wheat at Barcelona had brought 74s. per qr., and flour 57s. per sack of 280 lbs., while at Santander the price for first quality flour was only 41s. per sack of 280 lbs. The demand for Naples in Algeria had sent prices up to 55s. per qr. for hard wheat. Notwithstanding the opening of the ports in America, supplies, as yet, at New York were so moderate that prices were rather improved than otherwise, prime Kentucky wheat being quoted 57s. 4d. per qr. of 480 lbs. and white Canada 55s. per qr. of 480 lbs., while the best Missouri flour was worth 7 d. 75 c. per brl., or 45s. 8d. per sack of 280 lbs. English, against 46s., the top price of town-made flour.

The first wheat market in Mark Lane opened on the back of moderate English supplies and only one small parcel of foreign. The show from the near counties was below an average; and this, with the limited arrival of foreign, enabled factors to maintain the advance of 2s. realized on the previous Monday for the best samples; but those of inferior quality were difficult to quit. The business transacted in foreign was small, but at unaltered rates. The country markets in the course of the week, like London, showed a pause in the upward movement, the previous advance of 2s. being important after a long series of slow markets. Hull evinced some reaction on light supplies, and reported a decline of 1s. per qr. Liverpool was firm on Tuesday; but Newark was 1s. per qr. dearer, notwithstanding its being Easter week. The second Monday opened on moderate English supplies, and very little more foreign than last reported. But few parcels were sent up from Kent and Essex. Nevertheless, the holiday character of the day made a thin attendance and proportionate trade, there not being enough business to quote any change, and holders were quite indisposed to take less money, either in English or foreign descriptions. During this week the country markets were generally but scantily supplied, and several in consequence reported an advance of 1s. per qr. So it was at Leeds, Hull, Birmingham, and Bristol. Wakefield, later in the week, was 1s. to 2s. higher; Norwich, Newcastle, and York being up 2s.; Lincoln and Nottingham noting a rise of 2s. to 3s.; and London, on Friday, by the increased inquiry from Ireland, was dearer 1s., with every prospect of a further rise. Liverpool, on Tuesday, was only occasionally dearer, but an advance of fully 2d. per cental was established on Friday. The third Monday was rather better supplied from abroad, and more scantily with samples of home growth. The morning's contributions from Essex and Kent being small, and many of the country markets showing excitement, a corresponding feeling was evinced in Mark Lane, and factors were determined to make the most of it. But as millers were not over-eager purchasers, partly from having bought good foreign free on board, and partly from want of confidence in the reports from Ireland, business was done eventually on a rise of 2s. per qr. for good qualities, the market closing calm, and dull for inferior lots. All good foreign, however, participated in the advance of 2s. per qr., though with less doing than on Friday. The country this week was not backward in following the example of London, several places going beyond it. Hull, Leeds, Boston, Lynn, Newcastle, Bristol, and the markets generally were 2s. per qr. up. Sheffield, Worksop, St. Ives, and Stockton-on-Tees noted a rise of 2s. to 3s. per qr.; but Northallerton was dull, with a large supply, and Birmingham only advanced 1s. to 2s. from the same cause. Liverpool, on Tuesday, rose 2d. to 3d. per cental, and on Friday 1d. per cental dearer for fine red. The fourth Monday, for the first time this year, exhibited a liberal foreign supply, with but a moderate arrival of home-growth. The morning's fresh English supply was small; but the plenty of fine foreign from the Baltic, much of which was on millers' own account, prevented any further advance, and rather produced a pause in the movement, though facts went more to confirm the reported deficiency in Ireland. Former prices only could be obtained, and that very slowly, more especially at the Kentish stands, several of which were not cleared at the market's close. Foreign factors made no difference in prices, not having much to offer, and being confident of a farther rally ere long.

The country markets this week were generally firm, but unaltered, a few reporting a rise of 1s. per qr., and a still smaller number a reduction to the same amount.

The imports into London for the four weeks were 22,892 qrs. English wheat and 28,924 qrs. foreign, against 31,490 qrs. English and 37,596 qrs. foreign for the same period last year. No exports have taken place. The general averages show a gain in four weeks of 3s. 1d. per qr., commencing with 46s. 5d., and closing at 49s. 6d. per The London averages in the same time rose from 47s. 11d. to 51s. per qr.

The supplies of country flour through the month have been steady, and the fluctuations unimportant, a gain of 2s. to 3s. per sack ensuing as the consequence of the improvement in wheat. Very little foreign has, however, been received, the French markets having been all along too high, and being influenced by the rise here, while the rates of the best American keep this quality quite from our shores; good useful barrels have, however, been procurable at 28s. to 29s. per barrel, equal to 40s. to 41s. 8d. per sack of 280lbs. On the third Monday town millers raised their long-established top price of 43s. to 46s. per sack. The imports for four weeks into London have been 70,101 sacks country make 705 sacks and 260 brls. foreign, against 68,090 sacks English and 9,322 sacks 92 brls. foreign in April 1859. The exports were trifling.

The supply of British barley has kept up quite as well as expected; but the foreign arrivals have been less than one-half of what they were this time last year. As a consequence all descriptions rose the first and second Monday, noting a successive advance of 1s. per qr. Since then prices have been firm; but the advance has rather lessened the trade on grinding sorts. The limited quantity of really fine malting reduced maltsters to the necessity of using second-rate qualities; and as Scotch supplies have fallen off, this seems the only way to finish the malting season. The late large purchases in the Danube for spring delivery now seem likely to come to a paying market. The imports into London for the four weeks have been 10,437 qrs. British and 25,758 qrs. foreign, against 7,334 qrs. British and 62,856 qrs. foreign in April 1859.

Notwithstanding the movement in barley, malt throughout the month has been a dull sale, at unaltered quotations.

The oat trade for the last three weeks has had moderate supplies from Denmark and Sweden, and these being very much wanted have gone off well, at an improvement of 1s. to 1s. 6d. per qr., the most decided advance taking place on the third Monday. The last market was also rather against buyers; granary parcels, more especially Russian, have only slightly improved, 39 to 40lbs. per bush:, Riga being only worth 24s. per qr.; but without more liberal foreign arrivals the granaries must shortly be cleared out, as neither Scotland nor Ireland, more especially the latter country, seems able to meet the enormous demand of London. Holland, Belgium, and France, all quote higher rates; and there is a great failure in the Adriatic, which is taking off the stocks from Odessa. These circumstances, coupled with the want of grass and fodder of all kinds, seem still to point to higher prices, without a decided and speedy improvement in the weather. The improved supplies of home growth have partly made up for the deficiencies in Scotch and Irish sorts. The imports for the four weeks into London have been 7,037 qrs. English, 756 qrs. Scotch, 3,180 qrs. Irish, and 75,369 qrs. foreign, against 1,917 qrs. English, 5,494 qrs. Scotch, 10,361 qrr. Irish, and 133,155 qrs. foreign, in April, 1859, which exhibits a decrease of 64,585 qrs. There have also been 568 qrs. exported.

Beans show a rather improved supply; but the rise in barley and general want of fodder have kept up prices, which have been rather dearer for choice parcels. There seems to be very little prospect of their receding in value, even in the summer months, as the usual quantity is not expected this season from Egypt, where prices have been rising, and very few come from France. The imports for the four weeks have been 3,129 qrs. English and 3,312 qrs. foreign, against 2,145 qrs. English and 2,275 qrs. foreign this time last year.

The supplies of peas have been moderate; and very little change could be noted in their value. Maples all along have been dear—say 38s. to 40s. per qr.—and their scarcity seems likely to keep them so. Duns, at 34s. to 36s. per qr., have gone off steadily, there being no quantity offering, to attract much notice. Boilers have remained a heavy trade; but, being valuable when old as horse-feed, they have been rather more saleable of late, and will doubtless be cleared off in this way, if no previous contract should take off the small stocks in granary. For fine white boilers only 42s. per qr. has been asked. The imports for the four weeks have been, in English sorts 885 qrs., in foreign (chiefly white) 1,188 qrs., against 305 qrs. native, 705 qrs. foreign, in April, 1859.

The supplies of linseed have rather increased; but, notwithstanding a fair export trade, prices have lately somewhat tended downwards; still, the reduction has not exceeded 1s. per qr.; and the constant and increased demand for cake, at rather improved value, seems likely to keep the article at about its present range, all the sources of supply giving high quotations, as well as reporting short crops and low stocks. The protracted character of the spring has done much harm to the seed trade. Holders of red cloverseed, by a deferred demand, got so discouraged, that many submitted to low speculative rates, in sheer despondency. But, on the recurrence of a more favourable time for sowing, a demand sprung up, which revived prices quite 3s. per cwt.; and dealers now seem determined to hold out to the last, rather than suffer again. White seed, on the contrary, all along having from its scarcity been held at extravagant rates, has so kept a check upon purchases, that there seems a chance of some being left over; and this idea has not a little operated upon overconfident holders, who can have no intention of speculating on the smallest stocks, at present rates. Trefoil has been dull. Tares this season have been unusually neglected, from its backward and irregular character. Those still on hand have sunk to feeding prices, as low as 35s. per qr. having been taken for small, as they are not liked, for pigeons or other animals, till old. Canaryseed has been very dull, at a low range, its extended culture abroad giving speculators the idea of its being quite overdone; but one year's failure or discouraging rates will bring about a change in this fluctuating produce. Hempseed, mustardseed, and other seeds have little varied.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per	Quarter.
WHEAT, Essex and Kent, white, new 43 to 55 ....old	45 to	56
,, ,, red new 42 52 ....old	44	53
Norfolk, Linc., and Yorks., red..................	41	52
BARLEY, malting, new 30 to 38 .... Chevalier, new..	40	46
Grinding .... 28 30 .... Distilling	31	32
MALT, Essex, Norfolk, and Suffolk ... 49 to 57 .. fine	60	70
Kingston, Ware, and town made .. 49 57 .. ,,	60	70
Brown .... 48 49 ..	—	—
RYE ....new — — ..	30	31
OATS, English, feed ... 21 to 26 ...... Potato	27	30
Scotch, feed........ 22 27 ...... Potato	27	30
Irish, feed, white .... 21 to 24 .. fine	25	28
Ditto, black .... 21 24 .. ,,	—	26
BEANS, Mazagan........ 32 to 37 .... Ticks........	34	36
Harrow.............. 34 42 .... Pigeon	45	48
PEAS, new, white, boilers 36 40 Maple 37 to 38 Grey	33	34
FLOUR, per sack of 280 lb., Town, Households 41s., fine	43	46
Country .... 36 to 37 ...... Households ..	39	41
Norfolk and Suffolk, ex-ship	35	36

FOREIGN GRAIN.

	Shillings per	Quarter.
WHEAT, Dantzic, mixed 54 to — high do. — to 56 extra	— to	59
Konigsberg .... 50 55 ,, — —	—	—
Rostock .... 54 — fine 58 old 58	—	—
American, white .. 47 53 red.... 46 to 51	—	—
Pomera., Meckbg., & Uckermrk, red 51 53	—	—
Silesian, red ...... 46 51 white........	50	54
Danish and Holstein	48	52
Russian, hard 47 to 50 .. French 45 to 51 .. white	48	52
St. Petersburg and Riga	46	52
Rhine and Belgium...............................	48	54
BARLEY, grinding............ 27 to 30 .. Distilling..	31	32
OATS, Dutch, brew, & Polands 23 28 .. Feed	20	24
Danish and Swedish, feed .. 22 25 .. Stralsund.	22	26
Russian	21	23
BEANS, Friesland and Holstein	34	38
Konigsberg.............. 34 to 37 .. Egyptian	34	36
PEAS, feeding .... 36 37 .. fine boilers..	37	40
INDIAN CORN, white ...... 34 37 .. yellow	34	36
FLOUR, per sack.... French 32 40 .. Spanish, none	—	—
American, per brl., sour.. 25 26 .. sweet	27	29

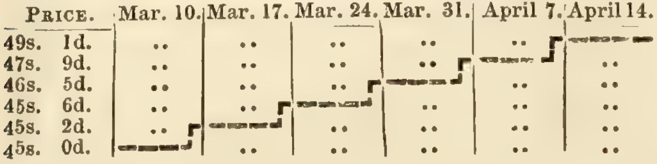
COMPARATIVE AVERAGES—1860-59.

From last Friday's *Gaz.*		s.	d.	From *Gazette* of 1859.		s.	d.
Wheat......	94,086 qrs.	49	1	Wheat......	105,060 qrs.	41	2
Barley......	21,913 ..	37	2	Barley......	30,727 ..	33	6
Oats	9,606 ..	24	2	Oats	10,028 ..	23	7
Rye	62 ..	36	10	Rye	52 ..	31	6
Beans	3,974 ..	39	9	Beans	3,254 ..	41	5
Peas........	793 ..	38	3	Peas........	284 ..	39	4

IMPERIAL AVERAGES.

For the last Six Weeks:	Wheat.		Barley.		Oats.		Rye.		Beans.		Peas.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
March 10, 1860	45	0	36	3	22	9	30	5	39	6	37	3
March 17, 1860	45	2	36	5	23	1	34	10	39	7	37	7
March 24, 1860	45	6	36	11	23	4	32	0	39	3	37	7
March 31, 1860	46	5	37	2	24	1	36	9	39	11	38	7
April 7, 1860	47	9	36	4	23	7	31	8	40	2	38	3
April 14, 1860	49	1	37	2	24	2	36	10	39	9	38	3
Aggregate average .	46	6	36	9	23	6	33	9	39	8	37	11
Same time last year	40	6	34	1	23	5	31	9	40	11	39	6

FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT.



MONTHLY RETURN.

An Account shewing the Quantities of Corn Grain, Meal, and Flour, imported into the United Kingdom, and admitted to Home Consumption, in the month of March, 1860.

Species of Corn, Grain, Meal, and Flour.	Imported from foreign Countries.			Imported from British Possessions out of Europe			Total.		
	qrs.	bush.		qrs.	bush.		qrs.	bush.	
Wheat	101651	5		0	4		101652	1	
Barley	133322	7		4	0		133326	7	
Oats	28711	1		—			28711	1	
Rye	—			—			—		
Peas	7042	4		66	2		7108	6	
Beans	25854	3		—			25854	3	
Maize or Indian Corn ..	66393	5		27	5		66421	2	
Buck Wheat	2469	1		—			2469	1	
Bere or Bigg	—			—			—		
Total of Corn and Grain	365445	2		98	3		365543	5	
	cwts.	qr.	lb.	cwts.	qr.	lb.	cwts.	qr.	lb.
Wheat Meal and Flour.	117773	1	3	169	0	11	117942	1	14
Barley Meal	—			—			—		
Oat Meal	61	0	0	—			61	0	0
Rye Meal	12	1	0	—			12	1	0
Pea Meal	—			—			—		
Bean Meal	—			—			—		
Indian Meal	262	1	11	2	0	0	264	1	11
Buck Wheat Meal	14	3	10	—			14	3	10
Total of Meal and Flour.	118123	2	24	171	0	11	118294	3	7

PRICES OF SEEDS.

BRITISH SEEDS.

Mustardseed, per bush., new 10s. to 14s. brown 12s. to 16s.
Coriander, per cwt. .... 14s. 16s.
Canary, per qr.. 50s. 54s.
Trefoil, new.. 17s. 21s.
Tares, winter, new, per bushel .... 0s. to 0s. 0d.
Linseed, per qr., sowing —s. to 64s. crushing.. 54s. to 58s.
Linseed Cakes, per ton................. £9 10s. to £10 10s.
Rapeseed, per qr,.................................. 62s. to 66s.
Rape Cake, per ton .... £5 10s. to £6 0s.

FOREIGN SEEDS, &c.

Cloverseed, red 38s. to 48s.............. white 82s. to 90s.
Trefoil .... 17s. 21s.
Hempseed, small, —s. per qr. .... Dutch —s. 40s.
Coriander, per cwt. .... 16s. 18s.
Carraway ,, ... 32s. —s.
Linseed, per qr., Baltic 50s. to 52s.....Bombay 52s. 56s.
Linseed Cake, per ton .... £9 10s. to £11 0s.
Rapeseed, Dutch .... 58s. to 62s.
Rape Cake, per ton .... £5 0s. to £6 0s.

HOP MARKET.

Borough, Monday, April 23.—We have no change to report in our market, which continues firm, with but little doing.

Mid and East Kents .... 80s., 105s., 140s.
Weald of Kents............... 62s., 75s., 82s.
Sussex........................ 60s., 75s., 76s.

Mease and Wild.

COVENT GARDEN MARKET.

LONDON, Saturday, April 21.—Vegetables continue to improve both in quality and quantity, and prices are becoming more moderate. Pine Apples have not altered since our last report. Grapes are a trifle cheaper. Good Apples and Pears are scarce. The former still consist of Golden Knob, Bess Pool, and Wyken Pippin, and the latter of Ne Plus Meuris, Beurré Rance, and Easter Beurré. Oranges are plentiful and cheap. Good Cobs realize 1s. per lb., and Spanish Hazel Nuts for planting 16s. per bush. Rhubarb is furnished in large quantities. Parsley is cheaper. Green Peas may be obtained. Potatoes realize 4s. 6d. per bushel. New frame ones may be had at from 3s. to 5s. per lb. Mushrooms can still be obtained in small quantities. Cut flowers chiefly consist of Orchids, Gardenias, Violets, Mignonette, Camellias, Azaleas, Heaths, Primulas, Geraniums, and Roses.

FRUIT.

	s.	d.	s.	d.		s.	d.	s.	d.
Strawberries, per oz...	1	6to	2	6	Pineapples, per lb.....	8	0to	12	0
Apples, per doz	2	0	6	0	Currants, p. half sieve	0	0	0	0
Oranges per 100	2	6	8	0	Apricots, per dozen ..	0	0	0	0
Melons, each...........	0	0	0	0	Lemons, per 100	5	0	8	0
Cobnuts, per 100 lbs...	100	0	0	0	Plums, per punnet....	0	0	0	0
Mulberries, per lb.....	0	0	0	0	Pears, per dozen	6	0	10	0
Grapes, per lb.........	12	0	20	0	Pomegranates, each ...	0	0	0	0
Chesnuts, per peck....	0	0	0	0	Filberts, per 100 lbs...	0	0	0	0

VEGETABLES.

	s.	d.	s.	d.		s.	d.	s.	d.
Broccoli, per doz.......	4	0 to	8	0	Beet, per dozen	1	6	2	0
Greens, p. doz. bunches	4	6	6	0	Onions, per half-sieve..	1	0	1	6
Cabbages, per do.......	2	0	3	0	Portugal, each	0	2	0	4
Seakale, per punnet....	2	0	3	0	Celery, per bundle......	1	6	2	0
French beans, per 100..	2	0	3	0	Shallots, per lb.........	0	6	0	8
Asparagus, per bundle .	6	0	10	0	Garlic, per lb...........	0	6	0	8
Rhubarb, per bundle ..	0	6	1	0	Lettuce, cab., per score.	1	6	2	6
Potatoes, per ton	90	0	100	0	Tomatoes, per ½-sieve ..	0	0	0	0
Do. per bush.	3	0	4	6	Endive, per score	1	0	2	0
Do. per cwt.	6	0	8	0	Radishes, turnp, per doz.	0	0	0	0
Do. new, per lb.	0	0	0	0	Horseradish, per bundle	1	6	4	0
Green Peas, per ½ sieve	10	0	12	0	Mushrooms, per pottle .	2	0	2	6
Carrots, per bunch	0	6	0	8	Parsley, per 12 bunches	4	0	8	0
Turnips, per bunch	0	5	0	7	Artichokes. per doz.....	6	0	8	0
Spinach, per sieve......	4	0	5	0	Marjoram, per bunch ..	0	0	0	0
Cucumbers, each	1	0	3	0	Savory, per bunch	0	2	0	4

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, Monday, April 23.—During the past week the arrivals coastwise have been small, but the trade continues dull. The following are this day's quotations:—

York Regents .. .. 90s. to 150s. per ton.
Lincolnshire ditto .. .. .. 80s. to 100s. ,,
Dunbar ditto .. .. 100s. to 120s. ,,
Perth, Forfar, Fifeshire Regents 80s. to 100s. ,,
Do., do., rocks and reds .. .. 75s. to 90s. ,,
Irish whites .. .. 70s. to 80s. ,,
French ditto .. .. 70s. to 80s. ,,
Belgian ditto .. .. 60s. to 70s. ,,

BOROUGH AND SPITALFIELDS.

LONDON, Monday, April 23.—For the time of year, the arrivals of Potatoes are moderate, and in somewhat improved condition. Good and sound samples are in request at full quotations, but inferior parcels are very dull. The imports last week were 6 bags from Rotterdam, 18 from Bremen, 6 from Harlingen, and 30 from Hambro'.

York Regents .. .. 120s. to 165s. per ton.
Ditto Flukes .. .. 120s. to 150s. ,,
Essex and Kent .. .. .. 80s. to 120s. ,,
Scotch .. .. 100s. to 120s. ,,
Ditto Cups .. .. 90s. to 100s. ,,
Dunbars .. .. 100s. to 120s. ,,

CHICORY.

LONDON, Saturday, April 21.—We have to report a moderate inquiry for both English and foreign Chicory, the supply of which is by no means extensive, at late currencies.

ENGLISH, per ton	£13	0	to £14	0	ANTWERP ...	£13	10	to £14	10
HARLINGEN....	13	10	14	10	DACKUM	0	0	0	0
BRUGES	13	5	14	0	GUERNSEY....	13	0	14	0
HAMBURG......	13	0	13	10	BELGIUM	13	10	14	10

HAY MARKETS.

LONDON, Saturday, April 21.—SMITHFIELD.—Trade rather active; prime qualities very dear. Supplies moderate.

CUMBERLAND.—Trade firm.

WHITECHAPEL.—A steady demand for both hay and straw at our quotations.

At per load of 36 Trusses.

	Smithfield.	Cumberland.	Whitechapel.
MEADOW HAY ..	60s. to 100s.	60s. to 100s.	60s. to 100s.
CLOVER	80s. 115s.	80s. 115s.	85s. 115s.
STRAW............	27s. 34s.	28s. 36s.	26s. 32s.

PRICES OF BUTTER, CHEESE, HAMS, &c.

BUTTER, per cwt.—	s.	s.	CHEESE, per cwt.—	s.	s.
Friesland	110 to	118	Cheshire	70 to	86
Kiel	110	112	Cheddar	74	88
Dorset, new	118	122	Double Gloucester	64	74
Carlow	106	114	HAMS—		
Waterford	106	114	York	80	86
Cork	108	120	Westmoreland	80	86
Limerick	100	106	Irish, new	76	84
Sligo	—	—	BACON: Wiltshire, dried.	4	68
FRESH, per doz. 12s. 0d. to 15s. 0d.			Irish, green	58	64

ENGLISH BUTTER MARKET.

LONDON, MONDAY, April 23.—Our Butter market is firm, at full prices. The protracted cold weather is telling sadly against the produce.

Dorset, fine	122s. to 124s. per cwt.
Ditto middling	110s. to 114s. „ „
Fresh Butter	12s. to 15s. per doz.

BELFAST, (Thursday last.)—Butter: Shipping price, 108s. to 114s. per cwt.; firkins and crocks, 11d. to 12d. per lb. Bacon, 61s. to 63s.; Hams, prime 78s. to 82s., second quality 60s. to 66s. per cwt. Prime mess Pork, 92s. per brl.; Beef, refined 120s. to 130s. per tierce; Irish Lard, in bladders 66s. to 70s., kegs or firkins 60s. to 64s. per cwt. Pigs, 50s. to 57s. 6d. per 120 lbs.

CORK BUTTER EXCHANGE, (Saturday last.)—The supplies in the market continue light, averaging about 400 firkins daily. Owing to the continued dry and parching weather, which limits the make of butter, prices have gone up during the week, fourths having risen 4s., and fifths 8s. above last week's price. The qualities are nearly all inferior, only two seconds having been made during the week. All the butter brought in bought up freely at quotations. If wet weather set in, prices would fall considerably. This day's prices range from 78s. to 130s..

CHIPPENHAM MARKET presented a very animated appearance, in consequence of the great demand for cheese, realizing a further advance on last market's prices. About 100 tons were pitched. Broad doubles, 66s. to 74s.; prime Cheddar, 70s. to 80s.; Loaves, 72s. to 78s.; Thin, 54s. to 60s.; Skim, 24s. to 32s. per cwt.

GLOUCESTER.—The smallest supply we have had since the fair has been established, owing to the supply of cheese being nearly cleared out. High prices would have been willingly paid if a good article could have been obtained; as it was, seconds and skim, of rather inferior quality, fetched from 50s. to 63s. per cwt.

CHESTER—About 70 tons were pitched. The demand was good, and nearly all sold at prices from 70s. to 85s.

GLASGOW.—Few cheese coming forward, and scarcely a buyer in the market. About three tons passed the weighhouse scales, and only one cart in the Bazaar. We give former quotations. Prime early made, 65s. 6d. to 67s.; late made and inferior, 57s. to 60s.; skim, 26s. per cwt.

WINES.

LONDON, FRIDAY, April 20.—In Wines we observe a moderate demand for most descriptions, with the exception of Capes, in which business is actually suspended, although some holders are offering on lower terms. At a public sale this week of 196 pipes Port wines, shipped by Jas. D. Harris, the bulk (upwards of 150 pipes) described as superior, and superior old, fetched from £34 to £37; a few went lower, and about 20 pipes at £38 to £39; 10 pipes at £44 to £46 10s.; and 3 pipes at £51 to £56 10s.

	£	£		£	£.
Port, very super. old, pr. pipe	69	70	Clarets—*(continued.)*		
Good old	50	55	Other qualities, per hhd.	16	25
Good young	38	40	Cargo	8	12
Common and fair	33	35	Hermitage, rd. & wh., 1st grth.	40	44
1858's	48	52	ordinary quality	14	16
Red Wines, from Oporto	—	—	Masdeu, per pipe	—	—
Lisbon White dry	28	30	French Red	20	22
Do. rich	32	38	Champagne, 1st qual., pr. doz.	—s	—s
Red	28	30	Other qualities	—s	—s
Bucellas	36	44	Sauterne } 1st quality	—s	—s
Carcavellos	38	42	Barsac } other qualities	—s	—s
Figuera	—	—	Hock, superior, per aum	£35	£50
Sherry, very superior, p. butt	70	80	Other qualities	10	30
1st class	50	60	Moselle, 1st quality	20	25
2nd and 3rd do.	36	45	2nd quality	10	16
Fair useable qualities	24	32	Madeira, E.I., 1st qual., p. pipe	80	95
Common and indirect	14	20	West India, 1st quality	75	85
Mountain, London Particular,			Direct	50	65
per pipe	—	—	Sicilian Red	—	—
2nd quality	25	30	Marsala	22	25
Lower do.	—	—	Cape White, good	£13	£14 0s.
Spanish, red, good, per tun.	17	18	Common and fair	£11	£12—s.
Common and fair, (scarce)	25	23	Cape Red, good	18	19
Clarets, 1st growths, per			Common & fair	16	17
hhd.	60	65	Teneriffe, London Particular.	36	—
2nd do.	35	50	2nd quality	24	—

MATTHEW CLARK & SONS.

TIMBER.

LONDON, SATURDAY, April 21.—Generally speaking, the demand is somewhat active, and very full prices have been paid for all kinds of Timber. The stock of Canadian is much reduced.

TIMBER. (Per load 50 cubic ft.) Import Duty 1s. per Load.	s.	d.	s.	d.
FIR, Riga	65	0 to	70	0
Dantzic and Memel crown best	70	0	80	0
second	50	0	65	0
small	45	0	57	0
Stettin	50	0	65	0
Swedish	50	0	53	0
small	44	0	47	0
Norway Balks	40	0	45	0
PITCH PINE, United States	75	0	80	0
OAK, Memel, crown	105	0	125	0
brack	75	0	85	0
Dantzic and Stettin, crown	100	0	115	0
brack & unsquared	50	0	70	0
WAINSCOT. (Per log 18 cubic ft.)				
Riga, crown	107	6	117	6
brack	82	6	87	6
Memel and Dantzic crown	87	6	97	6
brack	67	6	77	6

DEALS & BATTENS. (Per Petersburg standard hundred.) Impt. Duty 2s. per Ld.	£	s.	£	s.
Archangel and Onega	14	0	15	0
Seconds	11	0	11	10
Petersburg	12	10	13	10
Wyburg	11	0	11	10
Finland and Handsawn Swedish	9	0	10	0
Petersburg and Riga White Deals	10	0	11	10
Memel and Dantzic crown Red Deals	14	0	15	10
brack	9	10	10	10
Christiania & Sannesund Deals, White & Yel.	13	0	14	10
Second do.	9	10	11	0
Dram & Frederickstadt Battens do.	8	10	10	10
Dram 6½-inch do.	8	0	9	0
Gothenb'g, good Stocks	10	10	11	10
Common	9	0	10	0
Gefle & Swedish 14-ft. Deals	9	10	11	10
Swedish Deals & Battens, long Millsawn	10	0	11	15
Dantzic, crown deck, per 40-ft. 3-in.	20s.		25s.	
brack	14s.		18s. 6d.	

LATHWOOD. (Per cubic fathom.) Import Duty 1s. per load.	£	s.	£	s.
Petersburg	8	15	9	15
Riga, Dantzic, Memel, and Swedish	6	0	7	0
FIREWOOD. (Per cubic fathom.)				
Swedish Red Deal Ends	4	10	0	0
Norway Red & White Boards	3	15	0	0
Round & Slabs	3	0	3	5

STAVES. (Per mille pipe.) Import Duty 1s. per Load.				
Memel, crown	£170	0	190	0
First brack	160	0	165	0
Dantzic, Stettin, & Hambro', full-siz'd crown	160	0	210	0
Canadian stand. pipe	47	0	60	0
Culls	35	0	40	0
Pun., per 1200 pieces	14	0	16	10
Bosnia, thin brl. do.	29	0	30	0
United States, pipe	18	0	33	0
Hhd., heavy	20	0	30	0
slight	12	0	16	0

BARK, &c.

LONDON, SATURDAY, April 21.

	£	s.	£	s.		£	s.	£	s.
English, per ld. of 45 cwt. del. in London	17	0 to	21	0	Cork Tree, Barbary	8	0	8	5
Coppice	18	0	22	0	Do. Sardinian	11	0	11	15
Dutch, per ton	6	0	7	0	Valonia, Smyrna, p. ton	15	10	17	0
Hambro'	6	0	7	0	Do. Camata	15	10	17	0
Antwerp Tree	7	0	8	0	Do. Morea	11	0	11	0
Do. Coppice	7	0	8	5	Terra Japonica } Gambier	16	15	17	0
Mimosa, Chopped	9	0	11	0	Terra Japonica } Cutch	26	0	27	0
Do. Ground	11	0	12	0	Divi Divi	10	0	12	0
Do. Long	8	0	9	0	Myrabolams	8	0	11	0
					Sumach, Sicily, p. cwt.	0	14	0	15

HIDE AND SKIN MARKETS.

LONDON, SATURDAY, April 21.

	s.	d.	s.	d.		s.	d.	s.	d.
MARKET HIDES:					HORSE HIDES, each	9	0 to	11	0
56 to 64 lbs.	0	4¼	0	4½	CALF SKINS, light	2	6	5	0
64 to 72 lbs.	0	4½ to	0	4¾	Do. full	8	0	0	0
72 to 80 lbs.	0	4¾	0	5	Shearling	1	4	0	0
80 to 88 lbs.	0	5	0	5½	Kents and Half-breds	9	0	10	3
88 to 96 lbs.	0	5¼	0	6	Downs	6	9	8	6
96 to 104 lbs.	0	6	0	6¼	Polled Sheep	0	0	0	0
104 to 112 lbs.	0	0	0	0	Lambs	0	0	0	0

WOOL MARKETS.

ENGLISH WOOL MARKET.

LONDON, MONDAY, April 23.—Since our last report, very little business has been passing in home-grown wool, and in most transactions the quotations have had a drooping tendency. The quantity on offer was somewhat increased, and there is scarcely any inquiry for export to the continent. The decline in the value of Port Philip wool at the Liverpool sales has had some influence upon this market.

Per sack of 240lbs.

	£	s.	£	s.
Fleeces—Southdown Hogs	£19	10 to	£20	0
Do. Half-bred Hogs	19	0	19	10
Do. Kent	18	0	18	10
Do. Southdown Ewes & Wethers	17	0	18	0
Do. Leicester do.	17	10	18	0
Sorts—Clothing, picklock	19	0	20	0
Do. Prime and picklock	18	0	19	0
Do. Choice	17	0	18	0
Do. Super	15	0	16	0
Do. Combing—Wethermatching	20	0	21	0
Do. Picklock	17	0	18	0
Do. Common	16	0	16	10
Do. Hog-matching	23	10	24	0
Do. Picklock matchig	18	10	19	10
Do. Super do.	16	0	16	10

LEEDS (ENGLISH AND FOREIGN) WOOL MARKETS, April 20.—The high price of English combing wool prevents any large purchases being made, though there is still a fair demand for some sorts, and prices are very firm. Short wool also continues high. In colonial the sales are not numerous;

the long continued cold weather is operating against the spring trade. Low wools are in good request, and prices are higher for sorts in demand.

BRADFORD WOOL MARKET, (Thursday last.)—We have no improvement in the wool market, sales are upon the smallest scale, and buyers reluctantly pay the rates now current. In noils and shorts there is scarcely the same animation, but prices remain about the same.—*Bradford Observer*.

LIVERPOOL WOOL MARKET, April 21.

Scotch.—Laid Highland of good quality continues to be enquired for, with rather more business doing; lower qualities are still neglected. White Highland in request at our quotations. Good Cheviots are light in stock, and sell at very full rates.

		s.	d.		s.	d.
Laid Highland Wool per 24lbs.		11	0	to	12	6
White Highland	do.	14	6		18	0
Laid Crossed	do...unwashed	14	6		16	6
Do.	do...washed	16	0		18	6
Laid Cheviot	do...unwashed	17	0		20	0
Do.	do...washed	19	6		26	0
White Cheviot	do...washed	32			40	0

Foreign.—The public sales which commenced here on the 18th inst., attracted a large attendance of buyers, both home and foreign, and opened at a decline of about 1d. per pound on fine wools, and at about previous rates for East India and other useful low wools.

FOREIGN AND COLONIAL WOOL MARKET.

	Per lb.	s.	d.		s.	d.
German, Saxon, and Prussian.	1st and 2nd Elect	3	4	to	4	6
	Prima	2	4		3	0
	Secunda	2	0		2	4
	Tertia	1	8		1	10
Colonial:—Sydney—	Lambs	1	5½		2	7
	Scoured do.	1	5		3	0
	Unwashed	0	8½		1	4
	Locks and Pieces	0	8½		2	0½
	Slipe and Skin	1	3½		2	0½
Port Philip—	Lambs	1	5½		2	5½
	Scoured do.	1	4		3	5
	Unwashed	0	11		1	4
	Locks and Pieces	0	10		1	10½
S. Australian—	Lambs	1	5½		1	8½
	Scoured do.	1	9½		2	6
	Unwashed	0	9½		1	4½
	Locks and Pieces	0	8½		1	5
V. D. Land—	Lambs	1	11½		2	4
	Scoured do.	1	2½		1	11½
	Unwashed	0	0		0	0
	Locks and Pieces	0	0		0	0
Cape of Good Hope—	Fleeces	0	10½		2	5
	Lambs	1	0½		1	10½
	Scoured	0	8		2	4½
	Unwashed	0	8½		1	3

BRESLAU WOOL REPORT, April 19. — Business during the last fortnight has been rather quiet, and transactions did not amount to their previous extent, being altogether only 1,700 cwts. They consisted chiefly of Russian combing and clothing wool at from 58 to 68 thalers per cwt., do. scoured at from 95 to 98 thalers, and middling Polish fleeces at from 72 to 76 thalers. Prices did not undergo any material alteration; only the finer descriptions, being very scarce, realized a few cents more than hitherto. The chief purchasers were Saxon combers and clothiers, as well as country manufacturers and a Breslau commissioner, who acquired a superfine flock for English account. Fresh imports from Russia and Poland almost equalled the sold quantity.—Gunsburg, Wool-broker.

GERMAN WOOL FAIRS.—It will be interesting for those who visit the German wool fairs to know that the complaints about the irregular commencement of the different fairs of late years have induced the Prussian Government to publish the following order:—"It has been decided by the Ministers of trade and agriculture that the wool fairs in Breslau, Posen, Landsberg, Stettin, and Berlin, on account of a conformable order, shall take place henceforward and in the current year on the following days:—In Breslau from the 7th to the 10th June, in Posen from the 11th to the 13th June, in Landsberg from the 14th to the 15th June, in Stettin from the 16th to the 18th June, and in Berlin from the 19th to the 23rd June. Before the appointed time of the market days, the beginning of the wool fairs in the towns named, or the weighing of the wools, and the use of the public weighing machines, or the storing of the wools in those public places which are used for that purpose during the wool fairs, shall henceforward not be permitted.—Potsdam, 27th March, 1860.—The President of the Provinz Brandenbourg, Staatminister Flottwell."

FLAX, HEMP, COIR, &c.

LONDON, Saturday, April 21.—The amount of business doing in Flax, since our last report, has been very moderate. In prices, however, no change has taken place. Baltic Hemp is steady, and Petersburg clean is selling at £29 10s. per ton. Jute and Coir goods move off slowly; nevertheless, prices are supported.

OIL MARKET.

OILS.

Olive, Florence, half-chests	£1 10 0	to	£0 0 0
Lucca	1 1 0		0 0 0
Gallipoli(252gals)	61 0 0		0 0 0
Spanish	59 0 0		60 0 0
Linseed (cwt.)	1 7 9		1 8 0
Rape, Pale	1 19 0		2 1 6
Brown	0 0 0		1 19 0
Cod (tun)	38 0 0		40 0 0
Seal, Pale	36 0 0		37 0 0
Do. Brown, Yel. &c	30 0 0		34 0 0
Sperm	96 0 0		100 0 0
Head Matter	102 0 0		0 0 0
Southern	31 0 0		33 10 0
Cocoa-nut (cwt.)	2 0 0		2 5 0
Palm	1 18 0		2 6 0

RESIN.

Yellow (per cwt.)	£0 6 0	0 6 6
Transparent	0 6 0	0 6 6

PITCH.

British (per cwt.)	£0 6 0	0 6 3
Archangel	0 0 0	0 0 0
Stockholm	0 10 3	0 0 0

TURPENTINE.

English (per cwt.)	£1 15 6	0 0 0
American	1 16 0	0 0 0
Rough	0 0 0	0 9 9

TAR.

American	£0 0 0	0 0 0
Archangel	1 1 6	1 2 0
Stockholm	1 3 0	1 0 6

WHALEBONE.

Greenland, full size (per ton).	£400 0	£430 0
South Sea	370 0	0 0

MANURES.

PRICES CURRENT OF GUANO, &c.

PERUVIAN GUANO (per ton, for 30 tons)	£12 5 0	to	£12 10 0
Do. do. (under 30 tons)	12 15 0		13 0 0

ARTIFICIAL MANURES, &c.

Nitrate Soda per ton	£15 10 0	to	£16 0 0
Sulphate of Ammonia	14 15 0		15 10 0
Muriate of ditto	17 0 0		20 0 0
Corn Manure	7 0 0		7 10 0
Superphosph. of Lime	5 10 0		6 0 0
Salt	1 0 0		1 5 0
Coprolite (gr'd)	2 12 6		2 15 0
Ditto (whole)	2 2 0		2 5 0
Estramadura Phosph. of Lime for 70 p. ct. p. ton	4 5 0		4 15 0

Gypsum	£1 5 0	to	£1 10 0
Bone Ash, for 70 per cent.	4 12 6		4 15 0
South American Bones	4 15 0		5 5 0
London ditto, uncrushed	4 12 6		4 15 0
Do. ½-inch p. qr.	0 18 0		1 0 0
Do. dust	1 0 0		1 1 0
Animal Charcoal	4 10 0		4 15 0
Oil of Vitriol, concentrated, per lb.	0 0 1		0 0 0
Do. Brown	0 0 0¾		0 0 0

OIL-CAKES.

Linseed-cakes, per ton—		
Thin American, brls	£10 12 6	£10 15 0
Ditto bags	10 5 0	10 10 0
Marseilles	9 0 0	9 2 6
English	9 10 0	10 0 0

Rape-cakes	£5 10 0	to	£6 0 0
Cottonseed Cakes—			
American decorticated	none.		
Ditto, English	6 0 0		6 10 0

JOHN KEEN, Agent, 35, Leadenhall-street.

Agricultural Chemical Works, Stowmarket, Suffolk.

Prentice's Cereal Manure for Corn Crops	per ton	£8 10 0
Mangold Manure	,,	8 0 0
Prentice's Turnip Manure	,,	6 10 0
Prentice's Superphosphate of Lime	,,	6 0 0

Manufactured by Hodgson and Simpson, Wakefield, and
Matthews and Co., Driffield, Yorkshire.

Nitro-Phosphate	per ton	£6 10 0
Ammonia-Phosphate	,,	8 0 0

LIVERPOOL GUANO AND SEED, &c. MARKET,

April 21.—Guano, import, has been in request of Upper Peruvian; sales of best at £7 5s. to £7 10s, second £6 7s. 6d. to £6 10s. per ton; Kooria Mooria at £4 15s.; Patagonian £3 15s. Nitrate of Soda in good consumptive demand, at the quotations. Bone Ash a quiet but steady market. Cattle Bones in request. A large demand for Linseed Oilcake; about 500 tons sold. In Cloverseed a large business, chiefly on account of speculators for new red American at 38s. 6d. to 40s.; the market is firm, at the latter price.

Guano, Peruvian	£12 0 0	to	£13 0 0
Do. Upper do.	5 0 0		7 0 0
Ichaboe, per ton	4 5 0		5 10 0
Patagonian	3 15 0		4 0 0
Saldanha Bay	4 0 0		6 0 0
Kooria Mooria	4 0 0		6 0 0
Pedro Keys	3 0 0		5 0 0
Sulphate of Amo.	14 0 0		15 10 0
Bone Ash	4 10 0		5 10 0
Do. dust	5 10 0		6 5 0

Linseed Cake per ton—			
American, bags	£9 10 0	to	£0 0 0
English	10 0 0		10 5 0
Cotsd. Cake, decor.	7 15 0		8 0 0
Locust Beans p. ton	6 0 0		6 5 0
Nitr. of Soda, p. ct.	0 13 6		0 16 0
Linsd. Bomby, p. qr.	2 10 0		2 12 0
Cloverseed, American, red, new, per cwt.	1 18 6		2 0 0
Tallow, 1st P.Y.C.	2 18 0		2 19 0

SAMUEL DOWNES, General Broker,
Exchange Court, Liverpool.

Printed by Rogerson and Tuxford, 246, Strand, London.

A Hampshire Down Ram.

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THE FARMER'S MAGAZINE.

JUNE, 1860.

PLATE I.

A HAMPSHIRE DOWN RAM.

THE PROPERTY OF MR. J. W. BROWN, OF UFFCOTT, SWINDON.

"The Hampshire and West Country Down is a very important branch of the Down family; and as the Sussex Down is the favourite in the eastern counties, so is this breed in the western and south-western counties. Again, as the Sussex Downs are descendants of the sheep which formerly occupied those hills, the latter are descendants of those white-faced horned sheep that had ranged from a very early period the hills and downs of Wiltshire and Hampshire. Their improvement dates from the commencement of the present century, when recourse was had to the Southdown; from successive crosses this very valuable class of sheep was established, and I think it will be generally admitted that a flock of Hampshire Downs now presents as great a uniformity in wool, colour, and general appearance, as their smaller but handsomer cousins the Southdowns. They have lately rapidly risen in public estimation, and find considerable favour in the London markets. But it is said by some (with what truth I know not) that like the Londoners, who are fond of them, they have rather large appetites. A gentleman who stands high as a successful exhibitor of this class of sheep at our national shows, in reply to my inquiries, states that 'they are the best description of sheep for Wiltshire, Berkshire, and Hampshire; in fact, the large sheep fairs, such as Overton, Alresford, Wilton, Ilsley, and Weyhill, are supplied with very little stock of any other sort; they are very hardy and of good constitutions, good wool bearers (the average weight of a well-kept flock is from 6 to 7 lbs. each fleece), of early maturity, and have plenty of lean as well as fat meat; they will graze to almost any weight you may think proper to make them.' The same gentleman also states 'that they have been very much improved the last few years by a slight cross with the Southdown.' Another gentleman, not a breeder of Hampshires, but who has had considerable experience in the feeding of them, states that 'they are a good useful sheep; the better bred ones will bear comparison with other breeds; but there are some not to be desired—those that are too large are very slow in feeding, and when fat are of second quality;' and in his opinion 'it is very easy to get a Hampshire too big.' The ewes are good breeders and sucklers, and combined with the excellent management they receive in these counties, some most extraordinary lambs are raised, which at barely eight months old command enormous prices at their autumn fairs. Their draft ewes also find a ready sale, and are distributed throughout many parts of England, chiefly with the view to cross with the Cotswold or other long-woolled rams; but the former is more commonly used, and I have seen some very wonderful lambs the result of this cross."

This very able epitome of "the history of the Hampshire Downs" is taken from Mr. Charles Howard's recent paper on the merits of pure and cross-bred sheep. Mr. Spooner goes yet more elaborately into the origin and excellence of the Hampshires, in his article on cross-breeding in the last number of the Royal Agricultural Society's *Journal;* and Mr. Robert Smith also refers to this breed or variety, so that we are kept well up in our information about them.

Mr. Brown's ram took the first prize and gold medal at the Paris Exhibition in 1856, in commemoration of which the sheep was christened "Paris the First." Mr. Brown's himself thus puts the several recommendations of the Hampshires:—"Sheep of this breed have many advantages over any other. They are of a strong constitution, with plenty of natural flesh, combining the two essentials—lean as well as fat—and are great wool-growers. They come to maturity as lambs fit for the London market at about ten or fourteen weeks old, and make good mutton at from one year to about thirteen or fourteen months old, after being shorn: their weight then would average from ten to thirteen stone, depending much on how they are kept. On wet land they will thrive, where a more tender description of sheep would not; but, of course, like all sheep, they do best in a dry situation. This breed is well calculated for crossing, either with the pure-bred Leicester, Sussex, Cotswold, or Shropshire Downs. I have lately killed a ram got by the sheep in the print, which weighed over twenty-five stone, Smithfield weight; and I have sent the skin to the South Kensington Museum where it may be seen. The weight of wool upon it is upwards of 20 lbs., it being two years' growth."

PLATE II.

POLYDORA,

WITH THE SISTER TO PANDORA AT HER FOOT.

Polydora, bred by the late Duke of Portland in 1837, was got by Priam out of Manto, by Tiresias—Walton—Young Noisette, by Diomed—Noisette, by Squirrel.

Priam, bred by the late Sir John Shelley in 1827, was by Emilius out of Cressida (an own sister to Eleanor), by Whiskey, out of Young Giantess, by Diomed. Priam was a famous racehorse, and a winner of the Derby. He was purchased of Sir John Shelley, when an untried colt, for a thousand guineas, by the Chifneys, who sold him, after his three-year-old performances, to Lord Chesterfield, for three thousand. The Americans sprung five hundred on this; and the horse left England for North America in September, 1836. During, however, the short time Priam was in the stud here, he gave ample proof of his value as a stallion, his fillies being especially good. These included, in an unprecedentedly short period, three Oaks winners—Miss Letty, Industry, and Crucifix. A subsequent offer of four thousand, to redeem Priam, was refused.

Manto, bred by Mr. Foljambe in 1824, won the Sapling at York, and went to the stud in 1831. The Duke of Portland had also another Manto in his possession, but neither of much repute for her produce.

Polydora passed from the Duke into the possession of the Messrs. Tattersall, and went to the Willesden Paddocks, where, in 1843, she threw a colt by Taurus; the next season, a filly by Glaucus; and in 1845, another filly by Ratcatcher, christened Black Bess. The mare missed in 1846, '47, and '48, during which period she again changed hands; and in 1849 inaugurated her advent at Althorp with Medusa, by Touchstone. She missed again in 1850, and the next thing, her first filly by Cotherstone, in 1851, was sold as a cast-off, at a year-old, for a ten-pound note. Since then she has been regularly served by this horse, who is also the property of Lord Spencer. In 1852 the clipping two-year-old Polydore, a winner of the Molecombe and Clearwell, turned up; and in '53 a colt called Wrotham. There was no produce to credit her with in either 1854 or '55; and Mr. George Payne, after the taste he had in Polydore, secured Pandora, the filly of '56. She, too, was very smart—for a time, at least; and the chesnut one, that stands by the old mare in the print, also fell to Mr. Payne's bid: but the company last year was a little too good for her. The filly of '58—Polyolbion—Sir Joseph Hawley gave 140 for; and she made her début at Northampton, for the Althorp, against Walloon and others, but with no distinguishing merit. Another filly in '59, and another still this spring, go so far to complete the family history.

Lord Spencer's yearlings come to the Corner on Monday next, June 4th. They include, this year, a bay colt by Grampian or Cotherstone out of Annetta (the dam of Nina Ambrose, Glenmasson, and Northampton), by Priam; a bay filly by Cotherstone out of Glenluce (Harlestone's dam), by Slane out of Sister to Glencoe; a bay filly by Cotherstone out of Countess (Viscount Brignall's dam), by Slane out of Mrs. Anson, by Gladiator; a chesnut filly, by Cotherstone out of Prairie Hen, by Stockwell out of The Wryneck (Stilton's dam); a bay filly, by Newcourt out of Swallow (sister to Stilton), by Cotherstone out of The Wryneck, and the bay filly by Cotherstone out of Polydora. These are all good-looking, well-bred mares, with some character in the stud. Mr. Wilson, the stud-groom, however, considers Polydora "quite the tip-top as a brood-mare;" and her produce generally bring the highest prices.

TOP-DRESSINGS.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

In this unusually late spring the question of top-dressing has become of more than ordinary importance. And this remark is not confined to the grasses, however essential to our live stock may be an early and rapid growth of green food. The entire question of top-dressings both for grasses and corn lands will indeed well repay our anxious and extended examination. The mode of the action of several substances usually employed as dressings; the latest period at which these or a portion of them may be applied; their practical utility for the *second* crop are only amongst the chief sections of this most important research. In the present scarcity of food for stock another question imports itself into the enquiry, viz., the degree of rapidity with which the commonly applied spring dressings operate. The most prompt of these in their action are cubicpetre and Peruvian guano. It was on a recent opportune occasion that Mr. Caird remarked, when briefly speaking on the late scarcity of spring feed, and the use of stimulating dressings: "The most sure in its action on the grasses, either in dry or wet weather, and probably also the most rapid, is nitrate of soda. I shall use it," he adds, "pretty largely at the rate of 2 cwt. per acre. No outlay can pay better. The addition of 1 cwt. of Peruvian guano or 2 cwt. of the best superphosphate of lime will materially increase the produce."

Every reader of this magazine is aware that the effect of these fertilizers is materially accelerated, if they are sown in wet weather. And this fact leads us to another suggestion, well worthy of careful examination, viz., the advantage of applying these dressings in as wet a state as possible, either by the water-drill, or by mixing them with wetted ashes, or other friable substances, and also having this done as near sunset as possible. Even when water cannot be added, it is very desirable that the ashes should be used. It was in the last number of the Journal of the Royal Agricultural Society that Professor Voelcker observed, when speaking of the application of top-dressings, "I cannot refrain from observing that all artificial manures—such as nitrate of soda, guano, or a mixture of nitrate of soda and salt—should not only be first passed through a fine sieve, but they should also be mixed with three to five times their own weight of fine red ashes, dry soil, or sand, before sowing them broadcast by hand, or, what is much more convenient and better, by the broadcast manure distributor. Chambers' or Reeves' dry manure distributor cannot be too highly recommended for sowing, in a most uniform and expeditious manner, top-dressings of every description."

I certainly seem to incline very strongly to the opinion, that the maximum benefit in applying cubic petre to grass, is obtainable by applying it in solution. Some experiments of the late P. Pusey on a small scale decidedly support this view of the case (*Jour. Roy. Ag. Soc.*, vol. xiv., p. 376.)

The recently reported field experiments of Professor Voelcker on top-dressing wheat, are valuable on several accounts. They not only were conducted with the careful accuracy of the chemical philosopher, but they tend to elucidate more than one difficult question to which I have just alluded. In the opening sentences of his essay he observes (*Jour. Roy. Ag. Soc.*, vol. xx., p. 386):

"There is no lack of experiments made with guano, nitrate of soda, soot, shoddy, gas-water, and other nitrogenized substances, which are occasionally used as top-dressings upon wheat. Experience has shown that all these manures may be used, with more or less advantage, for the wheat crop; and that, generally speaking, they are the more effective the more nitrogen they contain. Thus Peruvian guano or nitrate of soda, which are both very rich in nitrogen, are justly considered more powerful wheat manures than soot or shoddy —two materials much poorer in this element. Whilst I consider the relative proportions of nitrogen in different fertilizers, intended to be used for wheat or other cereal crops, to be an important element in estimating the comparative commercial and agricultural value of artificial manures, such as Peruvian guano, nitrate of soda, or sulphate of ammonia, I am of opinion that the form or state of combination in which the nitrogen is contained in the manure materially affects its efficacy. Any one who has tried side by side nitrate of soda, Peruvian guano, and shoddy, must have felt surprised at the different degree of rapidity with which the effects of these three fertilizers are rendered perceptible in the field. I have noticed more than once that, under favourable circumstances, the effects of nitrate of soda became visible in the course of three or four days in the darker green colour and more luxuriant appearance of the young wheat, whilst it took eight or ten days in the case of guano to produce a similar effect. On wheat dressed with shoddy no apparent effect was produced even after the lapse of four or six weeks. So slow is the action of the latter that a superficial observer might well doubt the efficacy of shoddy as a wheat manure, for it often produces no visible improvement in the wheat crop, and it is only after thrashing out the corn that it can be ascertained that shoddy has had some effect upon the yield of corn. These examples appear to indicate that nitrogen in the shape of nitric acid has a different practical value from that which it possesses in the shape of ammonia, and that it has again another value in the form of nitrogenized organic matter. It must be confessed that our knowledge of the comparative efficacy of nitrogen, in its various states of combination, is extremely limited, inasmuch as we scarcely possess any sufficiently accurate and trustworthy comparative field experiments which are calculated to throw light on this subject. As yet the sure foundation on which an explicit opinion as to the relative merits of nitrogen —in the shape of nitric acid, ammonia, or organic matter—can be given, is altogether wanting. It is true the experience of practical men affords certain useful indications to the scientific observer, but nothing more. In the absence of clear, unmistakable, and sufficiently extensive practical evidence, no definite answer can be given to the question so frequently addressed to the agricultural chemist, Shall I apply nitrate of soda or guano upon my wheat?"

As Professor Voelcker's top-dressings were applied to the wheat on the 22nd of March, 1859, they do not serve to indicate at how late a period in the spring such dressings may be applied. The following table gives the manures applied by him and the produce per acre of both seed and straw, the first being given in bushels, the straw in tons and cwts:

	Seed.	Straw.	
Soil simple	27	0	17
2½ cwt. Peruvian guano	40 1-10th	1	3
1¾ cwt. nitrate of soda	38	1	4
180lbs. of nitrate of soda 1 cwt. common salt	40 6-10ths	1	4
4 cwt. Proctor's wheat manure	39½	1	3
6 cwt. ditto ditto	44 1-5th	1	7
Chalk marl 4 tons	27	0	16

There are some recently reported trials by Mr. Dove, of Eccles Newton, Kelso, which rather encourage us to hope that certain top-dressings may be applied with advantage much later in the season than is usually the practice. In his trials (*Trans. High. Society*, 1860, p. 229), the dressings to the grass were generally applied on the 13th of May. The following are the reported results; those described in italics, however, had the dressings divided into three portions, a third being applied on the 13th of May, the others on the 27th of May and the 3rd of June, the cost of each manure being £1 17s. per acre, and the produce given in tons and cwts.

	Tons.	Cwts.
Soil simple	1	4
3 Cwt. guano	2	0
3 *Cwt. guano*	1	15
2 Cwt. nitrate of soda	1	17
2 *Cwt. nitrate of soda*	1	19

The same experiment repeated on another portion of the field:

	Tons.	Cwts.
Soil simple	1	10
3 Cwt. guano	2	1
3 *Cwt. guano*	2	0
2 Cwt. of nitrate of soda	1	18
2 *Cwt. nitrate of soda*	2	1

The practical observations of Mr. Dove are well worthy of our earnest attention. He tells us, when commenting upon the result of his own experiments (*ibid*, p. 220), that he has generally found an application to grass of 3 cwt. of guano per acre to be equal to 2 cwt. of nitrate of soda, but that when a dry season occurs nitrate of soda has a decided advantage. He says, "Even if guano is applied on a wet day, and apparently well washed in, if it should immediately after set in for some weeks of dry weather, I have always observed that it has not nearly the same effect as it has when the weather continues damp for some time after; while nitrate of soda, if once washed in, never loses its effect. Taking this into consideration, along with the fact that it requires less rain to wash it in, I consider nitrate of soda decidedly preferable to guano as a manure for grass. Guano should only be used when the weather is favourable for getting it applied in April: when this can be done, it answers very well to apply a moderate quantity of it, and afterwards a little nitrate of soda some time in May.

In top-dressing potato oats on the 15th of April and the 23rd of May, the produce per acre in Mr. Dove's trials was as follows:

11 stones of nitrate of soda and 2 cwt. of common salt on the 15th of April	56 bushels.
11 stones of nitrate of soda and 2 cwt. of common salt on the 23rd of May	62 bushels.

In the very elaborate and valuable experiments at Rothamsted, by Messrs. Laws and Gilbert, on top-dressing old pasture land, other very important objects of enquiry have been steadily and successfully pursued. The results of these important researches have been reported in volumes xix and xx of the Journal of the Royal Agricultural Society, and these will be advantageously reperused by the farmer, for they contain much more valuable matter than may appear at the first reading. The main object of these laborious enquiries was to determine the effect of certain nitrogenous and mineral substances *applied for successive seasons to the same plots of natural pasture;* and to ascertain not only the amount of hay and aftermath produced by each, but also the different kinds of grass whose growth might be encouraged by the continued application of these different dressings. These natural grasses they divide in their elaborate report into three classes, viz.:

1. *The Graminaceous Herbage.*—In this is included the common rye grass, the woolly soft grass, the tall oat-like grass, the sweet-scented vernal grass, the bent grass, the quaking grass, the crested dog's-tail grass, the rough cock's-foot grass, the smooth-tailed meadow grass, the soft brome grass, the meadow oat grass, &c.

2. *The Leguminous Herbage.*—In this class they specify as present in the Rothamsted grass land the meadow vetchling, the bird's-foot trefoil, the perennial red clover, &c.

3. *The Miscellaneous Herbage, chiefly Weeds.*—In this the reporters include, as found in their plots, the rib grass or plantain, common carraway, the milfoil or yarrow, the sheep's-sorrel or dock, the silene or catchfly, various species of ranunculus or crow's-foot, the germander speedwell, and the bed-straw or cheese-rennet.

The soil of the half-acre plots of natural pasture at Rothamsted, on which these trials were made, is a somewhat heavy loam, with a heavy clay subsoil resting on chalk. These plots were *yearly* dressed in February or March *with one and the same kind of manure.* But each plot had a different *kind* of manure: two plots, however, for the sake of comparison, were left unmanured. After three years' experience, during which their produce had been carefully ascertained, these plots were in 1858 botanically examined. The result of these lengthened trials and observations was as follows (*Jour. Roy. Ag. Soc.*, vol. xx., p. 250).

The *effect* of these manures on the produce *per acre* of hay will be found in the subjoined table, which I thus abridge:

Plot, Nos.	MANURES. (Per Acre, per Annum.)	ANNUAL PRODUCE. 1856.		1857.		1858.	
		tns.	cwt.	tns.	cwt.	tns.	cwt.
	SERIES 1.—Without Direct Mineral Manure.						
1	Unmanured	1	2	1	5	1	2
2	Unmanured (duplicate plot)	1	0	1	3	1	10
3	2,000lbs. Sawdust	1	0	1	0	1	0
4	200lbs. each, Sulphate and Muriate Ammonia	1	15	1	13	1	15
5	200lbs. each, Sulphate and Muriate Ammonia, and 2,000lbs. Sawdust	1	15	1	13	1	17
6	275lbs. Nitrate of Soda	—		—		1	6
7	550lbs. Nitrate of Soda	—		—		1	11
	SERIES 2.—With Direct Mineral Manure.						
8	"Mixed Mineral Manure"	1	10	1	12	1	16
9	"Mixed Mineral Manure," and 2,000lbs. Sawdust	1	13	1	15	1	19
10	"Mixed Mineral Manure," and 200lbs. each, Sulphate and Muriate Ammonia	2	16	2	17	3	4
11	"Mixed Mineral Manure," and 200lbs. each, Sulphate and Muriate Ammonia, and 2,000lbs. Sawdust	2	16	2	17	3	1
12	"Mixed Mineral Manure," and 200lbs. each, Sulphate and Muriate Ammonia, and 2,000lbs. Cut Wheat Straw	2	8	2	14	3	0
13	"Mixed Mineral Manure," and 400lbs. each, Sulphate and Muriate Ammonia	3	2	3	1	3	7
14	"Mixed Mineral Manure," and 275lbs. Nitrate of Soda	—		—		1	17
15	"Mixed Mineral Manure," and 550lbs. Nitrate of Soda	—		—		2	10
	SERIES 3.—With Farmyard Manure.						
16	14 tons Farmyard Manure	1	15	2	7	1	17
17	14 tons Farmyard Manure, and 100lbs. each, Sulphate and Muriate of Ammonia	2	4	2	13	2	7

The estimated average annual amount of hay per acre from the aftergrass from the 17 plots was as follows :

Plot 1	produced of hay in lbs.	539
,, 2	,, ,, ,,	617
,, 3	,, ,, ,,	503
,, 4	,, ,, ,,	594
,, 5	,, ,, ,,	594
,, 6	,, ,, ,,	823
,, 7	,, ,, ,,	823
,, 8	,, ,, ,,	689
,, 9	,, ,, ,,	689
,, 10	,, ,, ,,	800
,, 11	,, ,, ,,	800
,, 12	,, ,, ,,	937
,, 13	,, ,, ,,	1,067
,, 14	,, ,, ,,	823
,, 15	,, ,, ,,	823
,, 16	,, ,, ,,	638
,, 17	,, ,, ,,	638

After then three years employed on these experimental grounds, the first four general conclusions to which the authors of these reports arrive, with regard to the influence of the fertilizers upon the growth of the natural grasses, are :

"1. That, whether the produce of hay be considerably increased by means of farmyard manure alone, farmyard manure and ammoniacal salts, or artificial mixtures of suitable mineral manure and ammoniacal salts, the proportion of the whole which will be *graminaceous* will be very much increased.

"2. That the produce will be by far the *most graminaceous* when the '*artificial mixtures*' are employed. In fact, when the increase of hay is obtained by artificial manures containing *both the necessary mineral constituents and ammonical salts*—and it is then greater than under any of the other conditions—both the *leguminous* and the *weedy* herbage are nearly excluded, and the produce is then, therefore, *almost wholly graminaceous.*

"3. That the *graminaceous produce itself,* when grown by *farmyard manure,* is less complex in character than that *grown without manure ;* whilst that grown by the *most active artificial manures,* is *less complex still.*

"4. That, up to an equal period of the season, the *graminaceous* produce, grown by the *active artificial manures,* will be in larger proportion in *flowering and seeding stem,* than that grown *without manure ;* and that the produce grown by *farmyard manure* will be in still larger proportion in that condition."

Such are only a few of the important practical questions relating to artificial dressings which will well repay the most patient and repeated examination. It is needless to remind the skilled agriculturists who read this widely-circulating magazine, of the increasing value of every improvement in the growth of food for stock. As there is yet time in many places during the season to try the effect of late top-dressings, I would earnestly commend such trials. There is no need, I again repeat, to risk either much time or money in this search after knowledge and power—a very small plot of grass will tell the effect, make the same response to such an enquiry as the adjoining broad acres. Nature is indeed ever ready to respond to questions of all sizes. These- dressings of small experimental plots it would be well to carry on till after the time of the removal of the first crop of grass. We all know how *possible* it is for the land to produce in the same season three or four crops of grass of even increasing weight; this is regularly and extensively accomplished in certain favoured localities by the owners of sewage-irrigated meads, both in Scotland, the southern water meads of England, and on the continent; and it is yet to be determined to what extent the pastures of our island may be increased in their produce by the use of more copious and oftener-repeated dressings than those we have hitherto applied.

THE MAY MEETINGS OF AGRICULTURE.

The recent General Meeting of the Royal Agricultural Society, was one of the fullest ever known. The Report was received, the Trustees were re-elected, the House-list was adopted, the Balance-sheet was approved, and the nomination of the new President unanimously agreed to. In fact there was nothing like "the scene" people seemed rather inclined to expect. There was very little cheering. There was not one angry encounter; and there were no offensive allusions. And yet, for these very reasons, perhaps, the May Meeting of 'sixty promises to be altogether one of the most effective and useful ever held. There was evidently a quiet determination amongst the members present to look into their own affairs; to judge for themselves if there were really any means for removing the complaints now so common; and, if so, to speak out. It was not merely Mr. Sidney who had again to bear the brunt of the business. Country Squires like Mr. Dent and Colonel Higgins urged the necessity of amendment. Intelligent travelled gentlemen, such as Mr. Girdwood and Mr. Grenville, protested against the exclusive character of many recent proceedings. From amongst the very members of Council Mr. Fisher Hobbs and Mr. Torr admitted the justice of what had been advanced, and bound themselves to see to it hereafter. One after another members rose to speak to the impolitic secrecy with which the proceedings of the Society were conducted; the "Job" elections that had recently occurred; and the too palpable manner in which the practical farmer was being, step by step, ousted from the Council Chamber.

Such were the more serious charges; while of these, the election of the Council and the election of the Editor of the *Journal* were the two points chiefly canvassed. As the Direction is constituted, nothing could have been fairer or more straightforward than the appointment of Mr. Hall Dare, as Secretary. Every Member of Council had the opportunity of supporting or opposing such a candidate as he chose; and some even of "the farmers," at the last division, went for him. With the Editor, on the contrary, four or five gentlemen arrogated all power to themselves; and they have thus tended to create an unsatisfactory feeling, that will not easily be subdued. It must have been equally unpleasant for the members who spoke to this point, and for Mr. Frere who heard them; but there is no concealing the fact that, so far as the country is concerned, the latter comes into office under the most unfavourable auspices. His being so entirely unknown is, of course, against him; but "the close borough" way in which his election was conducted is still more so. However, it may turn out the Journal Committee is still quite as much on its trial as their nominee.

Under any circumstances there can be no doubt of some limit for the future to the aristocratic element. The tone of the Meeting on Tuesday was too determined to be any further disregarded, and the farmers will yet have fair-play. But the present inconvenient mode of election will have to be altered; and, in doing so, the Council must honestly put this question to each other:—"Do we really wish the General Members of the Society to have any voice or power in the selection?" If such is the desire, or rather say the right of the general body, let such a right be really made available. If the election is still to be by voting papers, let one be sent a week or so previous to every member, with liberty to fill in as he desires; and let the return of this, with his signature attached, be sufficient to register the vote. If the Council is to be a House of Lords, a proxy is all according to precedent. Or, if personal attendance be still considered indispensable, let the name of each candidate be put seriatim, and his election made or rejected by a show of hands. Some correspondence in our paper of to-day refers further to this matter; while Colonel Higgins has suggested any other than the present plan; and Mr. Torr has promised to bring the question before the Council. Lord Walsingham, as chairman, deprecated anything like combination amongst the general members to seat their own candidates; but without consultation, of course his Lordship must see they are utterly powerless. The remedy is an open court. So far, the "combination" is all on one side.

It can scarcely be said that any one was bold enough to advocate the state of things as they are. Major Munn, however, undertook to say for the farmers of Kent how thoroughly satisfied that county was with the present conduct of the Society! But he unfortunately got on to the old simile of the cuckoo that turned the parent bird out of its nest, of which the meeting, rather to his dismay, made its own application. Mr. Barrow and Mr. Slaney were quite willing to give up their places if better men could be found. There was not much argument, perhaps, in such an offer; and so Mr. Slaney availed himself of the most inappropriate opportunity possible of adding that he was ready to give a ten or twenty pound note for the best plan for a labourer's cottage. Imagine any one in the midst of an important debate on the future of an important Society obtruding in this unaccountable manner! Lord Feversham chiefly distinguished himself by a definition of a practical farmer—"Any gentleman or nobleman who superintends a farm of his own, whether he makes two ends meet or not." Thus triumphantly armed, his Lordship went on to show that the Council was actually nearly all practical farmer as it was! But the more common acceptation of a practical man is one who has to live by his business. Or, put it a little more definitely as *tenant* and *landlord*, and then let his lordship count them up. He will soon see that the disparity has been really underrated, and how, as the gallant Major would illustrate it, one breed of bird has edged out the other.

After all, the great disappointment, if not the one blank place in the proceedings, was that the Implement Makers made no sign. They offered not one word in explanation of the extraordinary course of action they have recently decided upon. Indeed, we do not remember seeing one in the room. They appear to have migrated in a body from the Royal Agricultural Society to the Smithfield Club. The Special Meeting of the latter at the Freemason's Tavern on the same day was unusually well supported by "the Trade"—the Ransomes, Howards, and Garretts. The conference here was rather a stormy one, but it was eventually decided to transport the Club to Islington for a period of one-and-twenty years, and a Company has been started and a Committee has been appointed to carry out this arrangement. We are able to give the several resolutions arrived at or rejected; but the Smithfield Club appears to have an unwholesome objection to the presence of reporters, and so a very interesting debate is lost to us. We may, however, return to the subject.

The assistance of the Press at the Anti-Malt-tax Meeting of the Farmers' Club was not so desirable. Seldom has there been so lamentable a failure. The attendance was meagre, while the proceedings were of the most disorderly and unprofitable character. One or two speakers insisted upon introducing all kinds of irrelevant matter, and completely swamped the good intentions of such men as Mr. Bond and Mr. Fisher Hobbs (here again), who tried to hold them to their point. Others declined any interference at such a time, and wisely brought the *business* to a finish as soon as possible. Still, properly worked, by circular-letter or some other such a means of individual communication, an Anti-Malt-tax movement would be cerain of support from the Central Club. The meeting of Tuesday evening was simply unfortunate. In any public gathering it is not always quite possible to avoid such a scene; but the Chair and the good sense of the Society must be a little more emphatic in the observance of "Order."

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A Weekly Council was held on Wednesday, May 16, Lord Walsingham, President, in the chair—present: Lord Berners, the Hon. Colonel Hood, the Hon. W. G. Cavendish, M.P., Mr. Raymond Barker, Mr. Hodgson Barrow, M.P., Mr. Dent Dent, M.P., Mr. Foley, M.P., Mr. P. H. Frere, Mr. Brandreth Gibbs, Mr. Humberston, M.P., Mr. Knowles, Colonel MacDoual, Major Munn, Mr. Simpson, Mr. T. B. Western, Professor Wilson, and Mr. G. Wood.

The names of candidates for election were read. A letter from Mr. Hardy, of Maldon, was read, on "Deep Cultivation." Mr. Frere laid upon the table specimens of the strata underlying the bed of Whittlesea Mere, now drained, and added some explanatory observations, in anticipation of an article on the draining of the Mere, by Mr. Wells, to appear in the forthcoming number of the Journal. He explained the general aspect of the Mere and adjacent lands, and the old value for Reed, Sedge, and Pasturage, prior to the work of reclamation.

He went on to say that the land reclaimed might be divided into three classes—

1stly, The bed of the Mere (about 1,600 acres), covered with 3 feet of silt, and capable of bearing first-rate crops.
2ndly, On Mr. Wells's estate, about 1,000 acres, adjacent to the Mere, which from floods had received such smaller deposits on the peat as gave them a moderate value for cultivation, though subject to great injury from spring frosts.
3rdly, A tract of about 900 acres belonging to Mr. Wells, remote from the Mere, with little or no deposit from floods, which is now almost valueless, though subject to drainage taxes.

Mr. Frere gave information as to the work now in progress for claying the land of this last-named kind from the bed of the Mere, by aid of a railroad nearly 1 mile in length; and concluded with a few observations on the mode of culture to be adopted prior and subsequent to the dressing of clay. He also expressed a wish that landowners or occupiers in the north or west, who had undertaken or contemplated similar works, would put themselves into communication with the Society, anticipating mutual benefit from the comparison of the experience of the past and of designs for the future, drawn from different localities.

Lord Berners spoke of the great crops grown on reclaimed lands 30 miles east of the Mere, and of the consequent rise in value to such an extent that land was now let for £3 10s. per acre which had been purchased for about that same sum.

Colonel MacDoual, of Logan, spoke of similar improvements effected in the south-west of Scotland, particularly on a hungry iron-bound gravel soil, which, when dressed with 2 inches of clay, had been converted into pasture, the feed of which was worth from £2 to £3 10s. per acre.

The Council then adjourned.

A Monthly Council was held on the 2nd May, Lord Walsingham, President, in the chair. Present: Lord Berners, Lord Feversham, Lord Leigh, Lord Tredegar, the Hon. Colonel Hood, the Hon. W. G. Cavendish, M.P.; the Hon. A. Vernon, Sir John V. Shelley, Bart., M.P.; Sir J. V. B. Johnstone, Bart., M.P.; Mr. Amos, Mr. Barnett, Mr. Raymond Barker, Mr. Barthropp, Mr. Bramston, M.P.; Mr. Brandreth, Mr. Caldwell, Colonel Challoner, Mr. Exall, Mr. Brandreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Chandos W. Hoskyns, Mr. James Howard, Mr. Hudson (of Castleacre), Mr. Humberston, M.P.; Mr. Jonas, Mr. C. Lawrence, Mr. Milward, Mr. Pope, Mr. Shuttleworth, Professor Simonds, Mr. H. S. Thompson, M.P.; Mr. Torr, Mr. Turner (of Barton), Professor Voelcker, Mr. Jonas Webb, and Mr. Wilson (of Stowlangtoft).

The following new members were elected—

Bayley, Thomas, Lenton, Nottingham
Bywater, R. T., Coniston, Windermere
Dowden, Thomas, Roke Farm, Bere Regis
England, Richard, Binham, Wells, Norfolk
Gascoyne, William W., Sittingbourne
Keeling, Charles R., Yew Tree Farm, Penkridge
Marriott, Rev. James P., Cotesbach, Lutterworth
Masfen, Robert Hanbury, Pendeford, Wolverhampton
Moxon, William, 3, St. Martin's-place, London, W.
Ostler, John, jun., Walrond Park, Isle Brewers, Taunton.
Page, Edward, Bedford
Patron, Simon, 19, Bedford-place, Russell-square, London, W. C.
Rich, Stiles, Didmarton, Chippenham
Robinson, Isaac, Iron Foundry, Halesworth
Royston, Viscount, Wimpole, Cambridgeshire
Shaw, John, Britannia House, Banbury
Yoomer, George Edgar, Hoaden House, Ash, Sandwich.

FINANCES.—Mr. Barnett, Chairman of the Finance Committee, presented their report, by which it appeared that the current cash balance in the hands of the bankers was £5,429 12s. 7d. The Secretary's receipts during the past month had been duly examined by Messrs. Quilter, Ball, and Co., and were found correct.

IMPLEMENT COMMITTEE.—Col. Challoner, chairman, reported the recommendation of a letter to various implement makers, informing them that the combined finishing threshing machine does not come within this year's prize sheet. The report was adopted.

REPORTING COMMITTEE.—Mr. Thompson, M.P., presented the report, to which the numerous body of the Committee had unanimously agreed, after a long and careful consideration of the subject. They recommended that the Secretary should prepare notes of the business transacted at the Monthly Councils, the principal grounds of the decisions arrived at, with the numbers of the majority and minority in each case, and should furnish the newspaper press with a report of the proceedings as soon as practicable after the rising of the Council, and that the substance of reports received and adopted by the Council should also be given; and in cases where any written paper is read or laid before the Council, which is of too great length for immediate insertion in the proceedings, it shall be referred to the Editor to report upon at the following Weekly Council.

COUNTRY MEETING OF 1861.—The report of the Inspection Committee having been read, deputations from the following cities and towns of Yorkshire were received, and very great interest was excited by the numerous and influential body of noblemen and gentlemen attending to advocate the interests of the various places with which they were connected, and their desirability for the purposes of the Society:—

DONCASTER DEPUTATION.—The Earl Fitzwilliam; Mr. W. B. Wrightson, M.P.; Mr. G. H. Packe, M.P., Vice-Chairman of the Great Northern Railway; Mr. F. T. Foljambe, M.P.; Mr. Wm. Aldam, Frickley Hall, Doncaster; Mr. Thomas Walker, Doncaster; Mr. John Hatfield, Mayor of Doncaster; Mr. Alderman Dunhill, Doncaster; Mr. George Hutfield, Doncaster; Mr. L. B. Mason, Town Clerk, Doncaster; Mr. John Butterfield, Steward to the Town Council, Doncaster; Mr. William Tindall, Wheatley, near Doncaster (with respect to the Land); Mr. Seymour Clarke, General Manager, Great Northern Railway.

HARROGATE DEPUTATION.—John Greenwood, Esq., M.P.; Basil Thomas Woodd, Esq., M.P.; Thomas Collins, Esq., M.P.; George Kennion, Esq., M.D.; Mr. Samuel Powell, Land Surveyor.

HULL DEPUTATION.—The Mayor of Hull (Z. C. Pearson, Esq.); the ex-Mayor (Martin Samuelson, Esq.); Wm. Wright, Esq. (Sigglesthorne), Deputy Chairman of the Hull Dock Company and laudowuer; Mr. Alderman Bannister, shipowner and landowner; Mr. Alderman Moss, shipowner; Mr. Councillor Harrison, wine merchant; Mr. Councillor Dannatt, shipowner and laudowner; the Town Clerk of Hull (Robert Wells, Esq.). Accompanied by the Lord Hotham, M.P.; Lord Ashley, M.P.; the Hon. Admiral Duncombe, M.P.; James Clay, Esq., M.P.; Joseph Somes, Esq., M.P.; James Hall, Esq., Scarborough.

DEPUTATION FOR LEEDS.—Leeds: Mr. Beckett, to introduce; the Mayor (Wm. Kelsall); the Hon. George Lascelles, Harewood; the two Members, Mr. Baines and Mr. Beecroft; Magistrates, Sir Peter Fairbairn and John H. Shaw; Aldermen Kitson, George, and Botterill; Councillor Wright. Bradford: the Mayor (Mr. Wright); the two Members, Mr. Wickham and Mr. Salt. Halifax: the Mayor (Mr. Welsh); Mr. Stansfield, M.P. for Halifax. Huddersfield: the High Constable, Mr. Wright Mellor. Ripon: the Mayor (Mr. Kendall). Scarborough: Mr. J. Dent Dent, M.P. Keighley: Mr. Ambler, Edwin Eddison, Hon. Secretary.

WAKEFIELD DEPUTATION.—The Mayor of Wakefield (Mr. Henry Brown); Mr. Councillor Lamb; Mr. Thomas Cartwright Johnson, of Chevet; Mr. Wordsworth, Stump Cross and Oakenshaw; Mr. M. E. Naylor, Wakefield; Mr. Edwin Green, Harecroft, Members of the Wakefield Farmers' Club; and Mr. William Barratt, Secretary to the Farmers' Club.

York Deputation.—The Lord Mayor; Alderman Meek; Alderman Herbold; Alderman Leeman; Alderman W. Richards; and the Town Clerk.

Addresses signed by large numbers of the landholders in the county were presented; and the Council having heard the respective claims advanced by the several places, proceeded to the election, which terminated in Leeds being selected as offering the greatest advantages for the country meeting next year, on condition that the Mayor of that town entered into the usual agreement with the Secretary of the Society by the next Monthly Council on the 6th June.

Canterbury Committee.—Lord Leigh, Chairman, presented the report, which recommended the insertion of the usual advertisements for tenders for refreshments in the showyard at Canterbury in the London agricultural and local papers. The Secretary was directed to write to the Mayor calling his immediate attention to the absolute necessity of safe communication over or under the railway to the showyard. On the motion of Mr. Brandreth Gibbs, seconded by Mr. Barnett, a new Rule for the Prize Sheet was agreed to, viz.:—That it be incumbent on Exhibitors to prove the correctness of their Certificates if called upon by the Stewards or the Council to do so. On the motion of Sir John Shelley, seconded by Mr. Fisher Hobbs, it was resolved—That the Veterinary Committee be requested to inquire and report as to the advantages derived, or likely to be derived, by the members of the Society from the annual grant made to the Royal Veterinary College. The Secretary was directed to request Governors and members of the Society to forward their nominations of Judges of Live Stock to him by the 15th of June, in consequence of the early period of the month at which the Canterbury meeting is to be held.

A deputation consisting of the President, Lord Walsingham, Sir John V. Shelley, Bart., M.P.; the Hon. Colonel Nelson Hood, and Mr. Brandreth Gibbs, was appointed to confer with the Right Hon. the Chief Commissioner of Works, Parks, and Buildings for the purpose of ascertaining if any and what sites can be granted for the Society's proposed Metropolitan Meeting.

House List.—Agreeably with byelaws, the Council arranged an election list, to be recommended by them for adoption at the ensuing General Meeting.

The Council then adjourned.

The half-yearly meeting of the members of this Society was held on Tuesday, May 23, in Hanover-square, when it was attended by a larger number of persons than had been present at any meeting for several years. The chair was taken at noon by Lord Walsingham, and among those present were Lord Powis, Lord Berners, Lord Feversham, Sir W. W. Wynn, Bart., M.P., Mr. Hodgson Barrow, M.P., Mr. Slaney, M.P., Sir J. V. B. Johnstone, Bart., M.P., Mr. Erskine Wemyss, M.P., the Hon. Col. Hood, Mr. Humberton, M.P., Mr. Dent Dent, M.P., Mr. Raymond Barker, Mr. Humphrey Brandreth, Mr. Joseph Druce, Mr. Samuel Druce, jun., Mr. Clinch, Mr. Brickwell, Mr. Jonas Webb, Mr. Clayden, Mr. Twitchell, Mr. Noakes, Mr. Devas, Mr. Hercy, Mr. Frost, Mr. Goodwin, Mr. Nalder, Mr. Purves, Mr. Moore, Major Munn, Mr. John Wood, Mr. Grenville, Mr. Corbet, Mr. Milward, Mr. Weir, Professor Wilson, Mr. Stokes, Mr. T. Crisp, Mr. Frere, Mr. Torr, Mr. Sidney, Mr. Goldhawk, Mr. Exall, Mr. Girdwood, Mr. James Thomas, Mr. Rigden, Mr. Biggs, Mr. Tanner, Dr. Camps, Mr. Morton, Mr. Clutton, Professor Simonds, Mr. Bunny, Mr. A. Sutton, Mr. M. H. Sutton, Mr. Fielder King, Col. Findgall, Mr. Astbury, Mr. Fisher Hobbs, Mr. Brandreth Gibbs, Mr. Dashwood, Mr. Cohen, Col. Higgins, Mr. Ridge, Mr. Simpson, Mr. Hayward, Mr. Booth, Mr. Bond, Mr. A. Browning, Professor Morton, Mr. Lyall, Mr. Young, Mr. Halkett, Mr. Pain, Mr. R. Smith, Mr. Dunn, and Mr. Power.

The customary preliminary of reading the notice preceding the meeting having been observed,

On the motion of Mr. Raymond Barker, seconded by Sir W. W. Wynn, it was resolved unanimously that Earl Powis should be the President of the Society for the ensuing year.

The Vice-presidents and the Trustees of the Society were, on the motion of the chairman, re-elected.

The meeting then proceeded to the election of 25 members of Council. The following list was proposed rom the chair: Mr. Charles Edwards Amos, Mr. Nathaniel George Barthropp, Hon. William George Cavendish, M.P., Mr. Joseph Druce, Mr. William Exall, Mr. B. T. Brandreth Gibbs, Mr. William Fisher Hobbs, Mr. Chandos Wren Hoskyns, Mr. William Hutton, Mr. Samuel Jonas, Sir Edward Kerrison, Bart., M.P., Mr. John Kinder, Mr. John Bennet Lawes, Mr. Charles Lawrence, Lord Leigh, Earl of Macclesfield, Duke of Marlborough, Hon. Colonel Douglas Pennant, M.P., Mr. Joseph Shuttleworth, Mr. Robert Aglionby Slaney, M.P., Mr. Robert Smith, Lieut.-Colonel Charles Towneley, Lord Tredegar, Lord Walsingham, and Mr. Jonas Webb.

The voting papers having been filled up, Messrs. N. Grenville, Clayden, and Stokes were appointed as scrutineers.

The Secretary, Mr. Hall Dare, read the following report for the half-year:

REPORT.

The Society consists, at the present time, of—

72 Life Governors,
119 Annual Governors,
927 Life Members,
4,047 Annual Members,

making a total of 5,165 names on the list.

The finances of the Society have on no former occasion been in so favourable a condition.

The dividend on the estate of the late Secretary amounts to £970 11s. 10d., being at the rate of 10s. 11½d. in the pound, which has been paid into the Society's bankers.

The funded capital, which stood at £10,000, has been raised by further investment to the amount of £12,000 in the New Three per Cents.

The Finance Committee have appointed Messrs. Quilter and Ball to be the Professional Accountants of the Society, who by frequent and close examination of the books and accounts will materially assist the Committee.

The Council have elected Professor Voelcker, the Society's Consulting Chemist, to be an honorary member of the Society.

The Consulting Chemist is engaged in investigations on the following subjects:

Field Experiments on Wheat, Barley, and Turnips.
The Action of Simple Saline Compounds on the Soil.
The Feeding Value and Composition of Mangel Pulp.
The Chemistry of Cheese and Butter.

The Council having determined to select a literary and scientific Editor of the Society's Journal, have appointed Mr. Philip H. Frere to that office, and, from the high testimonials exhibited by that gentleman, feel confidence in hoping that he will succeed in conducting the Society's publications with efficiency and talent.

The arrangements for the Canterbury Meeting, to be held during the week commencing the 9th of July, are proceeding satisfactorily. The Implement Yard will contain nearly a mile and a quarter of Shedding, in addition to a very large entry of Machinery in motion;

and the entry of Stock, which will close on the 1st of June, is already large.

The Council, in the spirit which has guided them on former occasions, and considering the cordial reception which awaits them in the county of Kent, have thought they could not do otherwise than defer to the strongly-expressed wishes of the locality, that this special opportunity should not be lost for directing attention to the agriculture peculiar to the district, and have been induced to accept the offer of a considerable sum, to be distributed in prizes for Ploughing on the Kentish or turnrise system, as also for Hops, Wool, and certain Breeds of Live Stock.

The Council have decided, subject to the usual conditions, to hold the Society's Country Meeting next year at Leeds, for the district comprising the three Ridings of Yorkshire. Great anxiety was evinced by many localities in the county, to be selected as the place for the Country Meeting; but the advantages of Leeds and its neighbourhood, joined to the eligibility of the sites offered for Showyard and Trial-fields, have induced a decision in its favour, which it is confidently hoped will result in a most successful meeting.

In conclusion, the Council trust that the Society will prove itself to be in a position to pursue its career with renewed energy, and that its future may be marked by increased endeavours to advance the important objects for which it was specially constituted.

By Order of the Council,
H. Hall Dare,
Secretary.

Mr. Astbury moved that the report be adopted, and Col. Higgins having seconded the motion,

Mr. Sidney said the occasion on which they were assembled possessed a double importance. Not only was it the twentieth anniversary of the Society, but never within his recollection had there been so many members present at a half-year general meeting. He must say that he was not surprised at this; for whilst they had reason to congratulate themselves on the extraordinary progress which agriculture had made during that period, they could hardly have failed to observe that the character of the Society had totally changed, or at all events that the character of the Council had undergone a radical change. This alteration was especially marked by the report which had that day been presented. At the time when the Society was first established the Council embraced all the leading agriculturists of the day; it comprised the names of men who stood pre-eminently at the head of the agriculture of this kingdom—a position which none of the members of the Council at the present moment had any pretension to occupy (Hear, hear). There was to be found in their ranks Earl Spencer, who was not only a great landed proprietor, but an enlightened agriculturist and an extensive stock-breeder, and was otherwise distinguished from his own order in being united by the strongest ties of sympathy to the agricultural and farming class, who in return invested him with their fullest confidence. With Earl Spencer were associated Mr. Ellman, Mr. Handley, and Mr. Pusey, who particularly represented the agricultural class, and upon whom it was unnecessary for him to pronounce any eulogium (Hear, hear). There were also Mr. Youatt, a distinguished and able writer on agricultural subjects, and Mr. William Shaw, who had rendered as great and useful services to the agricultural interest through the columns of the newspaper of which he had the management, as it was possible to do. Another characteristic of the Council at that time was—and he believed there were many present who could fully bear him out in this statement that one-half the entire body was composed of practical farmers, or men of the middle-class (cheers). But what was the case now? Under the influence which good landlords naturally exercised over their tenantry—for he could not account for it in any other way—farmers feared or neglected to use their right of electing the Council, one by one the vacant seats had been absorbed by landlords or amateurs, and there were only thirteen persons on the Council who could be described as practical or engaged in the cultivation of the soil for profit; and he took it for granted as an obvious truism, that a man of intellect and education engaged in the cultivation of the soil for profit was greatly superior to one who cultivated the soil for amusement (cheers); that he enjoyed a larger share of the confidence of the farming community, and was likely to confer upon the Council a corresponding amount of advantage (Hear, hear). Whenever a practical farmer had been removed from the Council, his place had been filled up, not by a man of his own class, but by some nobleman, or son or son-in-law of a nobleman, or country squire, whose interest in the soil was no more than that of an amateur at the best, while men of the most glaring inefficiency with aristocratic connections were re-elected year by year. He (Mr. Sidney) did not deny—no one would deny—that the landed gentry of the country ought to be fully and fairly represented on the Council; but if they meant the Society to be efficient for good, there could be no doubt that they ought also to have a considerable infusion of thoroughly practical men (cheers). He remembered that when at the Warwick Meeting he took the liberty of making some similar observations to these, a gentleman who was now present, who had been a farmer, and through the application of a powerful artificial manure in the shape of an inheritance, had been converted into a squire, informed him that if practical farmers were placed upon the Council they would never attend (Hear, hear). But at the Council meeting at which the House List had been settled, two distinguished farmers who were regular attendants at the Farmers' Club meetings had been rejected in favour of two peers and a squire whose agricultural reputation was as yet unmade. When the Council was originally formed there was only one peer upon it; there were now seven, and three were chosen in preference to three men whose practical knowledge, general intelligence, and station entitled them to the confidence of the agricultural public. He alluded to Mr. Owen Wallis, of Northamptonshire, Mr. Pawlett, of Bedfordshire, and Mr. Rigden, of Sussex, all three members of a club—the Central Farmers' Club—to which he (Mr. Sidney) had the honour to belong, two of them regular attendants, and all of whom had been rejected in favour of men, in no respect so well qualified for the office as themselves (Hear, hear). But he would go further, and say that the whole course of the Society too much resembled that of the Royal Society, when it elected for its President a royal duke, and for its Fellows gentlemen perfectly innocent of possessing a spark of scientific knowledge (laughter), and ignored the claims of the first scientific men of the day. To speak plainly, the fact was that the Council of the Royal Agricultural Society was becoming an agreeable club, the members of which could meet together for a conversazione, and amuse themselves as a body of amateurs; it had ceased to represent the agricultural community at large (cheers). It reminded him of All Souls' College, where the qualification was "to be well born, well dressed, and a little knowledge of music" (laughter). He granted that if its only end was to instruct landlords, to impart to them a little knowledge where they had none, or to increase the small amount they already possessed, the Council of the Royal Agricultural Society of England had performed its duty and achieved that object in the most complete manner; but if, on the other hand, it was desirable that the affairs of the Society should be conducted on the principles on which it was founded, and that the agricultural intellect of the age should be represented upon it, then he contended it was the business of the Council, who were no doubt all-powerful in framing the house-list, to turn over a new leaf and take new men. An additional proof of the necessity for a change was to be found in the report which had that day been read to the meeting. He referred to the election of a new secretary, and also to the appointment of an editor for the Society's *Journal.* With regard to the secretaryship, there were candidates for that office who had distinguished themselves by their acquaintance with and application to agricultural pursuits, and were well-known to, and enjoyed the confidence of, every intelligent farmer in the kingdom. What was the course which had been taken by the Council? Why, acting upon the exclusive system to which they had become so unfortunately wedded, and which must make the Society so much more genteel and less effective, they had elected a gentleman, the son of an ex-county M.P., highly respectable no doubt, but entirely unacquainted with agriculture; about which, probably, he had never thought until he was put in nomination for the office of secretary (cheers and laughter). Now, when the Board of Agriculture elected a secretary, they adopted a very different course: they chose for that post Mr. Arthur Young, who was the first agriculturist of the time. This, then, was one thing which had excited a good deal of conversation and unpleasant criticism throughout the country, and to which the farmers took very decided objection (Hear, hear). Next, there was the appointment of editor of the Society's *Journal*, an appointment more remarkable and even more discreditable than that of the Secretary, if the Society was intended to be carried on for the promotion of agriculture (Hear, hear). That the gentleman selected was a highly-educated man, and a perfect gentleman, he readily admitted; but, considering that there were amongst the other candidates several men who had devoted themselves for years to the subject of agriculture and agricultural information, who had learned by experience both how to write and how to edit on agriculture, which were two utterly different things—as different indeed as painting and statuary—and who had in fact the confidence of the agricultural community, who were on intimate terms with all the best farmers in England, it was with surprise that people saw the Council electing a gentleman totally unknown to the agricultural world—a gentleman of middle age, without experience, without literary reputation, although doubtless connected with influential families — who commenced his editorial apprenticeship for the first time when he entered upon his duties as editor of the *Journal* (Hear, hear). Again, he would say that this was not the way to enlist public confidence in the Council. On the contrary, it invested it with the character of an amateur society—a comfortable club of fashionable amateurs and nothing more, whose only duty appeared to be to hold one show in the year and publish one journal, which was at the same time the most expensive and least read book extant (laughter). The design of the eminent men who were founders of the Society was that the Council should represent the science and practice of the agriculture of the kingdom (Hear, hear). He was quite prepared to hear imputations cast upon him on the present occasion, because it was known that he had been a candidate for the post of Editor of the Society's *Journal;* but he possessed this advantage, that his opposition and his criticism were not new and sudden, a vast number of the suggestions which he made at Chelmsford, Salisbury, and in Hanover-square, had one by one been adopted by the Council, although they still obstinately resisted the infusion of the middle class into their body. Whether the sentiments he had that day uttered fairly reflected those which were entertained by agriculturists throughout the country, would be known before many days had elapsed, when the reports of these proceedings had been circulated amongst them. In concluding his observations, he would once more repeat that the course the Council had pursued was not that which had been contemplated by Earl Spencer, Mr. Handley, and their coadjutors, when they united to form this Society, for the promotion and encouragement of the science and practice of agriculture in England (cheers).

Major Munn was anxious to address a few observations to the meeting, in consequence of the remarks which had just been made by Mr. Sidney. He (Major Munn) had been connected with the Society from its commencement, and although he had not of late years attended its meetings very regularly, he was a life-member, and had watched its progress, and the manner in which it had acted for the benefit of all classes of agriculturists, whether occupiers or owners, with an ever-growing interest. Mr. Sidney had told them that in what he said, he was echoing the opinion of the farmers of the kingdom; and although he (Major Munn) could not, perhaps, be included amongst them, yet having for many years cultivated 700 acres of his own land, which he had only just recently let to some excellent tenants, he too might be allowed to speak with some little authority upon the subject. He did not exactly gather from the observations of Mr. Sidney what was the real spirit in which the present movement originated; but he denied that that gentleman had fairly stated the sentiments of gentlemen connected with the county of Kent, or of some other counties with which he was acquainted. That morning, before leaving home, a paper was placed in his hands, purporting to have emanated from the manufacturers of agricultural machinery, and previous to that he had observed in the agricultural journals various references to the Council of the Society, which was represented to have fallen away from its original design and purposes. He found the manufacturers also saying that this year it was not their intention to exhibit their implements at the Society's Show, and writing to their agents, begging them to hold back their certificates until they had received a further communication from them. To his utter astonishment too, he observed that in a public analysis of the members of the Council, it was stated that the farmers were represented by only 25 per cent. Well, he was thankful for that proportion, and gladly expressed his gratitude to the gentlemen who had taken an active part in the Council, even though they might have committed some litle faults (Hear, hear). He was satisfied that they had carried on the Society honestly and faithfully (Hear, hear). What made him feel the more strongly on this point was, that he had seen a charge brought against one of the officers of the institution, and a highly honourable man; he alluded to Mr. Amos, their engineer. The judgment of that gentleman had been called in question. Now, he had not the honour of knowing Mr. Amos even by sight; but he might mention, in illustration of that gentleman's integrity and high sense of honour, that he, having had occasion to require his opinion upon a particular implement, Mr. Amos wrote him back to say, that before he pronounced that opinion he must know whether the article was intended for exhibition at any of the shows in which he was concerned, in which case he should decline the duty (cheers). All these things satisfied his mind that an undercurrent of feeling was in operation. It was very much to be deprecated; he did hope that ere long it would disappear, and that the Council and Members of the Society would work together with all the harmony that was necessary for success.

Col. Higgins said that the substance of Mr. Sidney's speech amounted simply to this, that the Council did not contain a fair representation of the farming classes; and probably it would be as well, and no doubt the Council themselves so thought, that the great body of practical agriculturists should be more fully represented. He had not the honour of knowing all the members of the Council; but he had no reason to suppose that they were not perfectly capable of discharging their duties, and promoting the objects of the Society, although Mr. Sidney had applied to them the words—*Bené natus, bené situs, moderaté doctus.* He wished that the mode of election of the Council was somewhat different, and on a future occasion he should certainly move an alteration in that respect,

After a few words from Mr. Raymond Barker in defence of the House List,

Mr. Barrow, M.P., did not profess to have any very practical connection with agriculture, having been occupied in other ways; and when he joined the Council it was as the representative of a particular class of farmers whose interests he was anxious to protect. He accepted a seat in the Council with the feeling that if he did not apply the information which he might acquire himself, he would be able to communicate it to his tenants, whose interest he could not promote without at the same time promoting his own. He was quite sure there was no landowner on the Council, however large might be his interest in the land, or however he might be an amateur rather than a practical farmer, who did not desire to communicate to the tenantry all the useful information which he obtained as a member of the Council. He admitted, however, that it was very desirable that representatives of the farmers of this country should have frequent opportunities of free intercourse with landlords at the Council board, and he would say individually, that if it were generally considered an objection to a candidate that he had no farm in his own occupation. As regarded the recent elections of officers, he would observe that one of them took place before the last half-yearly meeting, and as no objection was made then, the Council could hardly have expected to hear any objection on that occasion; while as regarded the second election, no peer was on the committee, and the members of that committee were, he believed, selected for their practical knowledge and experience. He could not believe that those who objected to the Council wished it to become a mere farmers' club. Such clubs might be very agreeable and very useful, but in his opinion the great value and importance of that Society arose from there being a mixture of landlords and farmers, and he was quite satisfied that it was not the interest of farmers that it should become a farmers' club or a debating society. He would only add, that as questions closely affecting agriculture often arose in Parliament, it appeared on that account desirable that the Council should include a certain number of members of both Houses.

Mr. Dent, M.P., said there certainly was a wide-spread feeling that there were on the Council too many persons connected with the landed, and too few connected with the farming interest (Hear, hear.) That feeling had no doubt been in a great degree strengthened by the comparative secresy of the proceedings of the Council (Hear, hear); but he would not enter at length into that question, because a committee had been appointed to consider whether or not it was desirable to make the proceedings more public. As regarded the selection of an editor for the *Journal.* having had the pleasure of meeting the new editor there, he hoped that in his hands that publication would be well conducted; but there certainly was a feeling that the proceedings connected with the selection was carried on in a very close manner, and the fact that Mr. Frere was not known to the agricultural world tended to increase the general dissatisfaction on the subject. When all the leading agricultural papers, and even the *Economist*, came forward complaining of the course pursued, one could hardly help feeling that where there was so much smoke there must be some fire. As regarded the election of the Council itself, he must say that he thought it would be far better if the candidates were all proposed and seconded in the usual manner. In conclusion, he would remark that though there might be nothing in the present management that was very faulty, that was no reason why they should not endeavour to bring about improvements (Hear, hear.)

Mr. Slaney, M.P., fully agreed with previous speakers, that there ought to be in the Council a fair and reasonable infusion of intelligent practical farmers. He happened to have been one of the earliest members of the Society, having attended with Lord Spencer the preliminary meeting which led to its formation, and he had deeply rejoiced to observe its progress and to see such wide-spread benefits diffused by means of the *Journal* and in other ways among the members. He hoped that the little differences of opinion which now existed, owing perhaps greatly to some mistakes which were made by their late unfortunate Secretary ("No, no"), would soon disappear. During the latter part of his life, the late Secretary did not perhaps do all that he might have done to promote the usefulness of the Society. Looking forward, however, he thought there was a good prospect of the Society's conferring increased benefits on agriculture throughout the length and breadth of the land. He was quite sure the Council would receive in good part the wish which had been expressed, that it was desirable that there should be a larger number of practical farmers on the Council, provided they could attend; for frequent, if not constant, attendance was necessary. As one of the humblest members of the Council, one who was getting an old man, and was not able to devote as much time to the affairs of the Society as he did formerly, he should be most happy to withdraw his name, in order that some other name might be substituted for it; and lest his feeling towards the Society should be misunderstood, he would at the same time offer a prize for the best essay on the construction of labourers' cottages, deep ploughing, or some other subject. He trusted they would all unite together in support of a society which had done so much good to the agriculture of the country.

Mr. Torr said, as a practical farmer who was a member of the Council, he wished to tell Mr. Sidney and those who concurred in his views, that he thought there were improved prospects for the Royal Agricultural Society, and that some of its late proceedings would bear comparison with the best proceedings of the early period to which he referred. In short, he believed that the Society was in an improved position in every respect. One word with regard to the selection of the Secretary and of the Editor of the *Journal.* He would not say one word against either of those gentlemen; but he certainly thought that one election ought to have been conducted on more popular principles. (Hear, hear). He had no doubt of the efficiency of Mr. Frere, but he thought a more popular mode of election would have strengthened his position, and at the same time have strengthened the Council by showing that it was not afraid to appeal to the members. (Hear, hear). As regarded Mr. Amos, he was confident that the Society could not have an abler consulting engineer, or one who would devote more time to its affairs. He might remark that he had himself gone to Mr. Amos to request him to act as a judge for other societies, and that he had refused on the ground that if he did not take that course he might afterwards be suspected of favouritism. (Hear, hear.) As regarded the manner in which the elections took place at the annual meeting, he repeated that there was in his opinion room for improvement; and if no one else did so, he should himself bring forward a motion on that subject. They had been exceedingly fortunate in their selection of a President, and never more so than in the past year. (Cheers). No nobleman in England could have filled the office with greater credit to himself or more satisfactorily to them than the noble lord, who would quit his post after the meeting at Canterbury. (Cheers). There had, however, been great defects in that respect as regarded the suitableness of the selection of the show. The President for each year should, he thought, be a gentleman who had great influence in the part of the country where the show was held; whereas they had taken Lord Ashburton to Lincoln, Lord Portman to Carlisle, and Mr. Handley to Bristol (laughter).

Lord FEVERSHAM said the whole address of Mr. Sidney turned on the point that there were not a sufficient number of practical farmers in the Council of that Society. Mr. Sidney had told them—and told them truly—that that was not his first appearance at their meetings. He had on former occasions canvassed and criticised—perhaps very properly—the proceedings of the Council, and on those occasions he had told them that, in his opinion, the number of practical farmers ought to be greatly augmented. He was not aware whether Mr. Sidney was himself a practical farmer.—[Mr. SIDNEY: "No, I am not."]—He believed that he belonged to a very useful profession. Whether he had belonged to that institution to which he had referred —All Souls' College, Oxford—he could not say; and whether he belonged to any of those clubs to which he had alluded in such a jocular and pleasant manner was also a point on which he (Lord Feversham) was ignorant. Mr. Sidney had told them, and very rightly, what were his complaints with regard to the proceedings of the Council; but he had omitted to give his definition of a practical farmer. He did not suppose he would for a moment contend that those only were practical farmers who were tenant farmers. He apprehended that an owner of the soil was a practical farmer, who residing for some months in the year in the country, had during that period a tract of land under his daily superintendence, rode frequently over the fields, observed the different kinds of culture which were being carried on, remarked upon any defects, and made inquiries as to the mode of cultivation, the kind and quantity of seed sown, and the causes of any deficiency which attracted his attention. If, in addition, this individual were in the habit of importing into his neighbourhood improved breeds of stock, whether it were cattle, sheep, or any other kind of animal—if he were accustomed to introduce in his neighbourhood different kinds of implements hitherto unknown, or of which the farmers of the district had had no experience, because they were too expensive for them to be the first to try whether or not they would enable them to make two ends meet; in this case, whether the individual in question farmed for profit or for amusement, there could, he apprehended, be no doubt that he came under the definition of a practical farmer. If this view were correct, he would appear to the meeting whether they were justified in assuming that there were but thirteen practical farmers on the Council of the Royal Agricultural Society. He (the Earl of Feversham) would rather say, after looking over the list of members, that at least 50 per cent. consisted of practical farmers ("Hear, hear," from Mr. Sidney). He would respond to Mr. Sidney's "Hear, hear," and unless that gentleman could show that such a person as he had just referred to was not a practical farmer, he must be allowed to differ from him as to what constituted a practical farmer. Though such a man might not actually follow the plough, milk his cows, or feed his pigs, yet he apprehended he did practically do the work of a farmer, and he was an important individual among the agricultural community of this country. He could assure Mr. Sidney that, as a member of the Council, he had no other object than to serve the agricultural interest to the best of his ability. He had always been a sincere, if not a successful friend and advocate of the farming interest of this country, and had always regarded agriculture as the foundation of the national prosperity, and as a branch of the national industry on which all the other branches were essentially and directly dependent. He begged pardon if he had expressed himself with any undue warmth. He assured all present that he took a deep interest in those who cultivated the soil; and he had only wished to ascertain from Mr. Sidney whether he was a practical farmer himself, or whether he considered that no one could be a practical farmer who did not enter into all the details of the business of farming. Among the practical farmers who had sat on the Council, were Mr. Ellman, Mr. Handley, and Mr. Pusey, who were landlords and friends of his own; but, on the other hand, Mr. Jonas Webb, Mr. Hudson, of Castleacre, Mr. Fisher Hobbs, and Mr. Torr, were, he was happy to say, members of the Council at the present time. Mr. Sidney must, therefore, admit that matters had not so entirely changed since the days of Lord Spencer, whose name must be held in the deepest respect, not only by the members of the Council, but by all the members of the Society, who were at all acquainted with Lord Spencer's merits and virtues.

Sir JOHN JOHNSTONE, M.P., said he happened to have been for some time a member of the *Journal* Committee. The Council referred to that committee the somewhat invidious task of looking into the qualifications of the candidates for the editorship, thinking it better to adopt that course than to leave the question to be decided by a vote of the whole body. The task was a very invidious and unpleasant one; but he did not believe a better selection could have been made; he firmly believed that the successful candidate had the greatest qualifications for the office. There was no dispute whatever on the point among the members of the *Journal* Committee. In the recommendation made by them to the Council, they were, he was sure, actuated by no other motive than a desire that the best man should be appointed, and until results proved the contrary, he did continue to believe that they did what was most conducive to the interest of the Society.

Mr. GIRDWOOD said having travelled five hundred miles partly to attend that meeting, he felt bound to say there was an immense deal of dissatisfaction expressed throughout the whole country at the present management of the Society, increased as this angry feeling had been by the appointment of the new editor. He never heard Mr. Frere's name till that gentleman was elected, though he had been attending to the literature of agriculture for the last twenty-five years, had long been a member both of the Royal Agricultural Society of England, and of the Highland Society. When the committee made its selection, it had before it, in the list of candidates, the name of John Chalmers Morton—a man who had distinguished himself in the agricultural literature of his own country, and who was familiar with that of most other countries. A feeling of the greatest astonishment was created among the agriculturists of England when such a man was passed by, in favour of one who was utterly unknown to, and therefore untrusted by, the agricultural community of England and of the world.

The Report was then adopted.

The **Chairman** announced that the House-List, as prepared by the Council, had been carried; and afterwards officially intimated to the Earl of Powis that he had been elected president for the ensuing year.

The **Earl of Powis** begged to thank the members present for the honour which they had done him; and although he knew the difficulty of occupying a chair which had been filled by Lord Spencer, Mr. Handley, Mr. Pusey, and the Duke of Richmond, he could assure them that he meant to do his best to promote the interests of the Society (cheers).

Col. **Hood** then read the balance-sheet for the half year—

Half-yearly Account, calending from the 1*st of July to the* 31*st of December*, 1859.

Receipts.	£	s.	d.
Balance in the hands of the Bankers, July 1, 1859	2047	18	7
Petty Cash Balance in hand, July 1, 1859 ..	6	8	1
Dividends on Stock	141	17	6
Governors' Life Composition	50	0	0
Governors' Subscriptions	50	0	0
Members' Life Compositions	125	0	0
Members' Subscriptions	409	2	0
Journal	231	11	3
Country Meeting (Warwick)	5407	13	6
Sale of Sundries	8	2	6
	£8477	13	6

Payments.	£	s.	d.
Establishment, including Rent, Rates, and Salaries	482	5	4
Postage and Carriage	14	10	0
Advertisements	1	18	0
Journal	964	14	7
Essay Prizes	50	0	0
Veterinary Grant (extra)	25	0	0
Chemical Grant	150	0	0
Subscription returned (paid in error)	1	0	0
Country Meeting (Warwick)	5432	13	9
Sundry items of Petty Cash	3	12	4
Petty Cash not accounted for by late Secretary	9	7	0
Balance in the hands of the Bankers, Dec. 31, 1859	1339	8	0
Petty Cash Balance, Dec. 31, 1859	3	4	4
	£8477	13	5

Examined, audited, and found correct, this 18th day of May, 1860.

(Signed) A. N. Hood,
William Fisher Hobbs, } Finance Commitee.
R. Milward.

(Signed) William Astbury,
John Druce, } Auditors on the part of the Society.
Henry Corbet.

The financial statement having been adopted,

On the motion of Mr. Pain, seconded by Mr. R. Barker, thanks were voted to the auditors, a compliment which was acknowledged by Mr. Astbury.

Mr. **Fisher Hobbs** was pleased to see so large an attendance of the general body of members; in fact, it was the largest meeting he had seen for many years. With reference to what had passed, no better advice could be given than that from Colonel Higgins, as to some improvement in the method of electing members of Council. In its original form, as laid before the Council itself, the house-list gave the number of attendances of members going out by rotation, as well as the names of the new candidates proposed; and he considered that such a statement of attendance should also be laid before the general meeting, as indeed had been the case until within the last two or three years, and he could not understand why so wholesome a practice had ever been discontinued. When he saw the numbers of members present that day, and while he knew the strong expression of feeling from without, he confessed he was surprised that no alteration had been effected in the House-List, but that the meeting had allowed it to pass as originally prepared by the Council. There was one point which he must take the present opportunity of pressing on the members, and that was the nomination of judges for the country meeting. The Council had much difficulty in selecting duly-qualified men, chiefly because they had so few names to select from. The names of gentlemen proposed as judges for implements should be sent to the secretary by the 31st of May, and those for live stock by the 15th of June; and he trusted that members would really take the trouble to exercise the privilege they possessed of making such nominations. He trusted, further, that the remarks which had been made that day would be taken all proper notice of by the Council, and that the suggestions made would lead to more satisfactory results.

The Chairman having inquired if any member present had any suggestion to make upon which the Council might act to the greater advantage of the Society,

Mr. Sidney repeated a recommendation he had previously offered—that an agricultural survey of the kingdom should be made under the auspices of the Society.

Mr. Neville Grenville asked where the General Meeting at Canterbury would be held? He also advised that public "posters" should announce this in the city, and not be pulled down and defaced, as had once actually occurred under the authority of the Council.

Mr. Moore considered that greater publicity should be given by way of notice to the trials of implements in the July Meeting.

Colonel Higgins thought that some little privileges might be advantageously allowed to the general members at the Summer Show. For instance, he would recommend that every member should be admitted to the private view on the first day without charge. He had earlier in the proceedings advised some more satisfactory mode of electing the Council, and now trusted the direction would at once proceed to deliberate on what appeared to be so general a wish of the members.

Lord Berners, in proposing a vote of thanks to Lord Walsingham for his conduct in the chair, dwelt upon the uniformly good feeling which had existed between the two classes comprising the Council.

Mr. Sidney seconded the motion, and Lord Walsingham having responded the meeting broke up.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

TO THE EDITOR OF THE MARK-LANE EXPRESS.

Sir,—Your leading articles in the two last numbers of the *Mark Lane Express* are much to the purpose; a third might be put stronger, with great propriety. The titled men who are *not* men of business should never be in office to the exclusion of practical, clever, business tenant-farmers. The management generally of that Society has gone down in public estimation. If I could have attended on the 22nd, I should have voted for Pawlett, Rigden, Sanday, and Wallis. And I feel annoyed by the abominable rule, "*No member will be allowed to vote who does not personally deliver his list to the President.*" If these lists could have been filled-up in the country, and returned when the members could not attend, the Council would not be what it now is. I remain, Sir, yours truly,

AN OLD MEMBER.

TO THE EDITOR OF THE MARK-LANE EXPRESS.

SIR,—The first article in your paper of yesterday is an important one for the best interest of the Royal Agricultural Society. Most of the members of this association are men, like myself, too busily employed in the daily routine of industrial avocations to lose a day in running up to town for the purpose of attending a "General Meeting" of this society; but there are many, like myself, who feel the necessity of more practical men on the committee of management, and who would gladly give their vote—not only on this, but on other important subjects which may be introduced, if they could give it, by proxy. I am, Sir,

Your obedient servant,

May 22. A TENANT FARMER.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—Will you allow me to say a few words on one statement in the Report of the Council of the Royal Agricultural Society published yesterday? Mr. Frere is said to have been selected in consequence of his "*high testimonials*." Now, sir, everybody knows that testimonials alone are perfectly valueless; they can readily be obtained, and their strength depends much upon the friendship of the donor and the *grade* of the candidate. If general report speaks correctly, Mr. Frere is an unknown man; and there is no public proof of his having written a single article on agriculture or its collateral branches! Then how, let me ask, could these high testimonials be given? Why are they not published? There is another feature in the report, that should not escape observation. The Council advertised for a "*scientific*" editor; but in the Report they say "scientific and *literary*." Why was the word "literary" withheld from the advertisement? Is this, sir, quite as it should be? Against Mr. Frere I have nothing to say; he may be a light hidden for a long time under a Cambridge bushel, or he may, like some seeds, now that he is brought to the surface, vivify and bear abundant fruit. This will be determined by his papers in the Journal; but at present there is something strange and inexplicable about the affair, which leads even the *passive* men, constituting nineteen-twentieths of the society, for once to open their eyes and ask a question.

I am, sir, yours obediently,

May 23. ANTI-TESTIMONIAL.

SMITHFIELD CLUB.

A special general meeting of the members was held at the Freemason's Tavern, on Tuesday last, May 22nd, at 2 o'clock. Lord BERNERS presided. There were also present: Lord Feversham, Hon. Colonel Hood, Sir John Shelley, and Messrs. H. Brandreth, Edward Frost, Alfred Sutton, Martin Sutton, William Exall, C. T. Tower, Jonas Webb, John Giblett, B. E. Bennett, Joseph Druce, John Clayden, H. Waters, John Hitchman, Thomas Mortin, R. Worthington, William Heath, Wm. Rigden, Thomas Twitchell, W. G. Guerrier, O. Wallis, Alfred Crosskill, James Howard, R. Garrett, Robert Morgan, R. Milward, Nathan Clayton, W. M. Bullivant, Brewster, Wm. Torr, Professor Simonds, J. J. Smythe, jun., H. Corbet, E. W. Moore, Allen Ransome, W. Banbury, W. Fisher Hobbs, S. Sidney, T. Pain, W. H. Davis, Samuel Druce, jun., Robert Charles Ransome, W. Tanner, Thomas Bigg, Charles Stokes, Robert Smith, B. T. Brandreth Gibbs, hon. secretary, and the Smithfield Club Solicitor, and the proposed Company's Solicitor.

The SECRETARY read the report of the Show Yard Committee:

"The Committee having considered the different proposals that have from time to time been made, are of opinion that the site known as Dixon's Layers at Islington is the most advantageous for the Club's exhibition. They therefore recommend that if a responsible company be formed, who will enter into an agreement to erect a suitable building on the site known as Dixon's Layers, to the satisfaction of the Club, also to pay to the Club one thousand pounds per annum, and to enter into an arrangement on similar terms to those now made with Mr. Boulnois, the Club shall lease their exhibition for a term of not exceeding 21 years, commencing 1862."

On a proposal that this report be received and adopted, Sir JOHN SHELLEY moved and Colonel HOOD seconded the following amendment:

"That the written recommendation of the Committee relative to an agreement being entered into with a responsible Company, to erect a suitable building on the site known as Dixon's Layers at Islington, in which the annual shows of the Club shall be held, for the term of 21 years, commencing from the year 1862, be received, and that the honorary secretary be instructed to send a copy of such written recommendation to every member of the club, and that such members be requested to signify to the secretary their individual assent or dissent to the terms of the recommendation. And that the further consideration of the recommendation by the general meeting be adjourned until the next."

A long discussion followed, but on being put by the Chairman, the amendment was negatived by sixteen to eight, and the report received accordingly.

Previous to the division the proposed Company's solicitor, at the request of the Chairman, read the names of the Directors already appointed: Messrs. Jonas Webb, Babraham (chairman); Joseph Shuttleworth, Lincoln (vice-chairman); Joseph Druce, Eynsham; John Clayden, Littlebury, Essex; Robert Leeds, West Lexham, Norfolk; James Howard, Bedford; Richard Garrett, Leiston; James Odams, Fenchurch-street; John Banister, South-street, Finsbury; John Giblett, Lower Clapton; Robt. Morgan, Camden Road Villas; and William Collins, St. John-street-road, Clerkenwell.

Colonel Hood then suggested that it would be more becoming if gentlemen so directly interested in the new company did not vote, and Mr. Jonas Webb withdrew on the motion being put. The other Directors, however, gave their votes, of course against the amendment.

The following Committee of the Club was appointed to confer with the solicitors: Messrs. Milward, B. E. Bennett, W. Torr, R. Charles Ransome, S. Druce, jun., Owen Wallis, Thomas Twitchell, and the six Stewards, viz.: J. Quartly, Henry Smith, Charles Stokes, Henry Waters, John Ford, jun., and T. B. Northeast.

It was further resolved:

"That a special general meeting of the members of the Club be held at the Freemasons' Tavern, Great Queen-street, on Wednesday, June 6th, 1860, at three o'clock, to receive the report of the Committee appointed on the 22nd instant, to confer with the solicitors, in order to make the necessary arrangements with the Company to carry the resolution into effect, and report the same to a special general meeting of the Club."

THE HERDS OF GREAT BRITAIN.

CHAP. XVIII.

THE HOLKER HERD.

Our bleak March trip last year to see Prince Imperial, and his attendant Waterloos and Fenellas, at Red Bank, had impressed us with rather a dreary notion of Morecambe Bay, which the early Cumberland remembrance of a seven hours' naval speech in favour of carrying the railway across it did not tend to lessen. The sun, however, shone out cheerily as we left the Lancaster and Carlisle at Carnforth, and skirted the many "windings of the silver coast" on the branch line towards Ulverstone. The sea breaks under the very wall of the railway, and winds in-and-out among innumerable creeks, clothed with dark-coloured plantations, which slope down to the water's edge. In fact, the marine and rural scenery is so strangely blended, that at one moment there was nothing to be seen but a few sea gulls out for a wade, or a stately heron standing on one leg and a green-weed reef, ready to strike a fish; and at the next there would be a troop of plump pheasants feeding on a knoll. The inland side presents a range of rocky fir-clad terraces, with primroses still lingering at their base: just the spot which a professor of geology might choose to "spend a wedded eternity with a greywacke woman;" while occasionally up some gorge, we could catch a glimpse of a distant church, or what seemed like a beacon-tower. Guides and beacons for centuries have been too often useless across those treacherous sands; and "One little man, round-faced, drowned 1577," "A poor apprentice and officer for salt," "A native of Geneva (Domenico Curatto)," and "Nine in one cart"—are but a tithe of those who have gone down.

Schuloff, son of Cossack, the pet bay sire of the district, was committing his fortunes, under safe convoy, to the sands that day, and a sight of his beautiful top, as he trotted down the road near Holker, was a pleasant object with which to begin "a quiet afternoon" among the herd. The Duke of Devonshire's Home Farm at Holker consists of some five hundred acres, three-fifths of which is in grass. Part of it is light loam, part on peat, part on land reclaimed from the sea, and the rest on rock. The park is hardly strong enough to make Highlanders fat; but it does yeoman service in freshening up annually one-hundred-and-fifty shorthorn bullocks, which are purchased as yearlings at Milnthorpe and Lancaster, and sold off at Brough Hill. The same number of Southdown ewes compose the flock, which was brought some five-and-twenty years ago from His Grace's property in Sussex. Since then it has been crossed extensively with Mr. Jonas Webb's tups, and last year thirty-five ewes were added from Mr. Rigden's, of Hove.

His Grace commenced operations in 1840, by the purchase of thirty cows and heifers from the neighbourhood of Castle Howard, with two or three crosses of the Earl's herd; and followed up the blood by the hire of Sir Launcelot (5166) for three seasons, and subsequently Lord Marlboro' (7166). At Mr. Bates's suggestion, he then bought Goodness and Ceremony at Wiseton. The former of this pair cost 80 gs., and was the dam of Balco 2nd, who left Mr. Ambler's hands for America, and there won the United States prize. His sire Balco (9918) had been added to the Holker herd at the Kirklevington sale; Homer (2134) was also an importation from Wiseton, along with King Lear (8196), who cost 200 gs., and left very little to show for it. In fact, His Grace felt that this first essay was not to his mind, and hence the entire herd of fifty lots fell under Mr. Strafford's hammer in 1851. Aided by his land-agent, Mr. George Drewry, who had come to Holker in 1845, His Grace then slowly and surely laid the foundation of a second. The first purchase of Oxford 15th for 200 gs. at Tortworth, decided what was to be its leading feature, and as one of her sisters, Oxford 11th, died from lightning in Captain Gunter's hands after breeding six bulls, and the other, Oxford 16th, went to America, Holker may with truth boast of having the only Oxford females in England. The two latter were sold for £1,029 at the Hendon sale, where Mr. Drewry made a good hit, with Lady Barrington 8th. Her calf Barrington (12447) had been purchased previously by Mr. Fisher, of Adelaide, for 200 gs., and she was in calf at the time to Duke of Cambridge (12742). The eldest of the two Cambridge Barringtons, which she produced at Holker, is now sold to Mr. Scollick, of Aldingham Hall, in the neighbourhood, and the second was handed over to the butcher in consequence of an accident, when he was only rising three. Cleopatra, a daughter of the Earl of Dublin, and Minstrel, bred by Mr. Parkinson, also came from Hendon; and Sarah Gwynne, who was purchased from Mr. Saunders, of Nunwick, laid a solid Gwynne foundation in new Northern soil. Among the other principal purchases were Laurel by Grand Turk, and Well-a-Day by King Arthur (13110) at Mr. Ambler's sale in 1857. The pair cost 100 gs. when only six weeks old, or 19 gs. more than Lady Feversham, who was bought from the Rev. Thos. Cator, of Skelbrook, on the following day. At Mr. Harvey Combe's sale, the Gwynnes had a 200-guinea accession in Dustie; and Cosey, by Cotherstone (6903), and Comfort, by Lord Scarboro' (14852), mother and daughter, joined the herd for rather less than half that sum on the Aldborough day.

The first bull purchase of importance in the new era, was that of the Earl of Warwick (11412), of the Princess tribe, in 1854, and bred by Mr. Stephenson, the breeder of Belvedere. He was bought from Mr. Gilbert, of Burton Fields, Warwickshire, and Countess of Oxford, Lady Love, and Nonsuch are still here to speak for him. His stock were, however, principally bulls, and he was sold to Mr. John Benson, the agent of the Duke of Bedford, who has done much for short-horns in Devonshire. To him succeeded Cambridge Barrington 2nd; and although there are five bulls and heifers left by him, a sight of the Countess of Oxford 2nd, and 8th and 10th Dukes of Oxford, is enough to make one regret that a cross which hit so exactly, should have ended so soon. Then came Hogarth, by Harbinger, from Rosa, by Baron of Ravensworth. He was bred by Col. Towneley, and let by him into Ireland; and then sold to Lord Spencer for 220 gs., and so on through Holker to Dr. Dickinson, of Ulverstone, the breeder of Young Ben, and many other capital shorthorns. At present 8th Duke of Oxford is principally used, and all the Oxfords went to Third Grand Duke both this year and last, accompanied by Laurel on their first visit.

A walk to the top of Bigland Scaur, which looks right down upon Holker Park, gave us the most comprehensive bird's-eye view of the pastures, the history of whose Shorthorn tenantry we have briefly essayed to trace. The rocky platform on which we stood, seemed like a sort of Arthur's Seat, and the profusion of oaks, ash, and sycamore through which we wound our path would have delighted "John Peel with his coat so grey," in the time when he could shoulder his pole and summon his trusty eight couple, for a crusade against the mountain foxes. To our right lay Ellerside Breast, pointing over some thousand acres of peat towards the lake country, where the snow was just seen to linger upon Coniston Old Man. More in front of us, was the hill of Hoad, rising above the woods of Low Frith, from whence the seaboard stretched boldly away past Ulverstone, and Conishead Priory, to the headland at Peel. Ulverstone was a fitting feature in a Shorthorn landscape. Its Young Ben had a few days before defeated all comers in the aged bull class at Dublin; and we had but to carry the mind back to its August show, to see its brace of Barons, Messrs. Torr and Sanday, adjudging its ten silver challenge cups, and Mr. Unthank beckoned over the rails into the ring, to decide the moot point between Duchess 77th, her companion Moss Rose, and Mr. Eastwood's Rosette.

Just beneath us, to the right of Holker Park, lay fully 130 acres of reclaimed land. The salt-marsh was nearly all drained to the depth of four feet, with two inch pipes, covered with peat moss or soil, to act as a filter and keep the sand out of the drains. It has been cropped with oats, green crops, wheat, and clover in succession, and the latter yielded two heavy crops last year. Now it is in wheat again; while the sandy part, on which there was no vegetation, will be in green crops.

Up to 1855, the herd were kept in a farm-stead on the edge of this reclaimed land, and were then shifted *en masse* to a commodious range of white free-stone buildings, which were built just under Old Park Wood. At present, exclusive of common dairy cows, they number twenty-five females, and six males, and Culshaw's brother is in office as herdsman. The sea-breeze stole pleasantly across the Hag meadow, and as we thought of the eternal rain, cows almost spectral with famine in the provinces, and a military band wildly discoursing music to nearly 170 bulls, with glaring eyes and curling backs under the roof of the Royal Dublin Institute, it was no small treat to be in that quiet spot, on the other side of the Channel, beneath an almost summer sky, and looking upon a bevy of cows and heifers, the like of which, for high natural condition and symmetry, we have scarcely ever met before.

Lady Love, a cow with a very nice head and a rare udder, was the first on parade, along with her young calf Ladylike, the only Hogarth left at Holker. He got them all good colours, and all bulls save this. Then came the long and low Nonsuch 2nd by Earl of Warwick, from Nonsuch, who has been under the sod for some months. The old cow was in calf to Duke of Glo'ster with Prince of Glo'ster, when she came from Tortworth, but he was sold to Mr. Saunders of Nunwick for 100gs., while her grandson Newminster departed to Mr. Clark Irving's in Australia last autumn. Laurel by Grand Turk, and an own sister to Mr. Stewart's McTurk, followed in the shape of a very nice-coated, deep, lengthy cow, with a very lively head. She is within a month of calving to 8th Duke of Oxford; but it was the sight of her very even, bloodlike, and capital-backed calf Countess of Barrington by 3rd Grand Duke, which decided Mr. Drewry to send all the Oxfords to that celebrated bull. Then we recognized the thick, short-legged, and hardy-looking form of old Cosey, with her calf Statesman's Daughter, well worthy both of dam and sire, and catching the horns of the latter to a nicety, as if to disprove the slur which rumour threw over his fertility. Statesman's Daughter has proved a capital thriver when she was once fairly set agoing, and the records of the weighing machine, on which the principal animals are checked every fortnight, showed her average gain for the last four weeks previous at exactly 25 lbs.

The Cleopatras mustered in great force, mother and three daughters. Cleopatra by the Earl of Dublin (10178) was bred by Mr. Adkins of Milcote, and is said to bear a strong resemblance to the 700-guinea Duchess of the Tortworth day. We thought her rather a Gwynne in flank, and a slightly Roman nose were her most promi- her general style; and a strong loin, fine depth of nent traits. Cleopatra 2nd by Prince of Glo'ster, and Cleopatra 3rd by Cambridge Barrington, both inherit her good back. The latter has capital quality, but her white ankles and her leg-offal generally gave you rather an idea of a Hereford. Cleopatra 4th is a very neat red and white heifer, and as she is by the Duke of Buckingham (14428) the old cow seems to have no small powers of adaptation.

A vision of Smithfield then loomed into sight in Sarah Gwynne, the eldest of the six of that tribe. She cost His Grace only 70 gs. at the sale of Mr. Saunders, who purchased her from her breeder, Mr. Ewan Troutbeck. There have been two calves from her at Holker, but she has refused to breed in her eleventh year, and is taking wonderfully kindly to her new oilcake life. At the time we saw her she weighed rather more than 20 cwt., and had made 58 lbs. in the last fortnight, or 4 lbs. less than Statesman's daughter. She is a very fine and roomy cow of a good old constitutional stamp, and has character for ever, but unfortunately in her prime she always carried her head rather low, and now that her back is expanding, her neck is assuming a fixed look more novel than picturesque. Carry Gwynne is a different style of animal, and darker in her roan, and only spoilt by a tendency to be a little high on the rump. Her powers of breeding have been singularly good, as she is scarcely four years and a-half old, and yet she has had three calves and is half gone with her fourth. Minstrel 2nd from Minstrel, purchased at Mr. Tanqueray's sale, and with two crosses of Bates in her pedigree, also joined the Gwynne array with her calf Marmion, by 8th Duke of Oxford, at her side. She is a good thick white heifer, with a capital middle, and a great deal of gaiety about the head, though not exactly with the delicate grace of Beauty's Butterfly, on which Mr. Drewry used to cast such longing glances when they were both calves, and think what a match they would be in a pasture. Dustie, a nice cow and capital milker (who has just calved Ossian to the 8th Duke of Oxford), brought back old Cobham recollections; and Maid of the Mill, by Marmaduke, by her side, with the proverbial crops of its race, and its close neck vein, looks well worth all the money which was given for her dam that day. There, too, was Coral, and her calf Charming Boy, the latest purchase from Milcote, rather unsymmetrical about the horns, but good all over, and with an udder and a breast of remarkable prominence. To all present seeming, she is one of the cheapest that ever came there.

Countess of Oxford, who is rather a smaller cow than her dam, did not join the group of Oxfords, as she had left two or three days before on a visit to Third Grand Duke, at Springfield. Oxford 15th is a great fine even cow, with rare quality; and her Grand Duchess of Oxford 2nd is perhaps the best of the three calves of Grand Duke and Oxford lineage. Still there is something more *piquante* about Countess of Oxford 2nd than any one of the tribe so far. She is a rich roan, with rather more white than her dam, guiltless of all forcing, as His Grace does not care for shows; and the style in which she holds up her beautiful head, with her Bates' nostril standing right out, and looks proudly about her, as if all the blood of Kirklevington was in her sole keeping, is enough to bring a photographer on to his knees with delight. As with horses, so with cattle; there is not more than one in a hundred that you specially care to fix on your retina, and think of when you are far away from herds; but she certainly is one. Her brother, Tenth Duke of Oxford, made one of the trio of Oxford bulls which then walked slowly towards us in Indian file (along with Knightley, a rich roan yearling, by Prince Imperial, from Aloyze 2nd), while the rest were all standing at ease over the meadow. He was perhaps in his handling the best of the three, and has been let for the season to Mr. Ashburner, of Irleth. The two others were from Oxford 15th. Of these, Duke of Oxford 8th, by Cambridge Barrington 2nd, is a pure Bates, and, with the exception of the shape of his horns, which go round with a buffalo curve towards his cheeks, he is a good-looking even bull, with a great second thigh, deep flank, and capital twist; in fact, beef to the heel, so to speak, and close in front. Ninth Duke of Oxford, by Mr. Bolden's Prince Imperial, is, on the contrary, rather upright in his horns, but a very thick capital-fleshed bull. He was far the heaviest of the lot at three months old, when he "came to a long check;" but as soon as he did commence thriving he added a hundredweight a month to his live-weight for four months in succession, and 82lbs. of it in the course of a fortnight. All this was done without any undue forcing; and, in fact, whether we look at its very great fertility, or the beautiful condition of the cattle, no herd reads a stronger lesson than the Holker as to the folly of that over-training which spreads as much havoc among heifers as it does among thorough-breds.

H. H. D.

THE CULTIVATION OF THE POTATO, AND ITS PREVENTION FROM DISEASE.

BY PROFESSOR TANNER.

The value of this root was never fully known until the appearance of the well-known potato-disease caused great losses, and much disappointment to accompany its general cultivation. The alarm which at first filled almost everyone's mind has, since then, subsided into calm, and every succeeding year has added fresh information upon this peculiarly interesting topic—the potato disease. I purpose, therefore, to notice the general character of the disease, and then proceed to the field-management of this crop, in different districts, and the modifications in practice, which have been introduced in consequence of the disease.

In 1843 the potato crop in America was much injured by disease, and some few instances were observed in England in this and the following year. It remained for 1845 to reveal the fearful loss which this disease was capable of producing. The weather had been remarkable during the summer of this year for a large amount of moisture, both in the form of vapour and in rain, accompanied with a more than usually clouded sky. From the 1st to the 10th of August the sun gained more power, and the moist atmosphere, combined with this increased warmth, caused a luxuriance of growth in the potato-crop, almost unparalleled. These hot and humid days were after this date succeeded by cold, and in some places frosty nights, and the consequence was that the potatoes were very generally struck with disease, so that within ten days almost every part of England joined in the panic-stricken cry "The potato-crop is destroyed." Those districts in which the potato formed the staple food were threatened with famine, and but for the praiseworthy exertions then taken by all classes of society, the horrors of famine would have been far greater than they were.

The loss and alarm thus occasioned led to the substitution of other crops; but in Ireland, where the sole support of the greater part of her population was potatoes and milk, this could not be accomplished immediately, and for two or three years great misery and distress prevailed. The Royal Agricultural Society of England was actively engaged, immediately after the appearance of the disease, in stimulating the introduction of remedial measures, and through her officers and other scientific men, investigations were instituted into the cause of the disease. From that day to the present time some degree of mystery has shrouded *the cause*, although many imagined that they knew the cause, still exceptions could in each case be produced to show that other agencies had been in operation.

These investigations followed by subsequent examinations bring the cause under that extended term "atmospheric agency." Those who advocated that guano and other manures, or the growth of fungi, or the development of animal life, had in their respective opinions been the cause, have since then seen cause to regard them either as results, or else as promoters of the disease rather than the cause. The true cause is, doubtless, wrapped up in the term "atmospheric agency;" and until we are more fully acquainted with the subtile influences here combined, and have some clearer views of their individual powers, we shall be unable definitively to explain the agency employed. There are, however, many who will be disposed to go with me even beyond this point, and view this disease as a remarkable visitation of Providence, intended to produce the most important results, and accomplished by the command of Him who rules and governs the operations of Nature, and at whose will the powers of the atmosphere became the agent employed for this purpose.

It would be a tedious task were I to recount to you the various causes which have been named as producing the potato disease. I shall restrict myself to that explanation which I consider bears upon it the impress of truth and which admits of proof. But before we notice this, it may be desirable to record the influence exerted by the disease. There is a great diversity of opinion as to whether the leaves, stem, or roots are the first affected. It admits of easy explanation why this difference of opinion should exist so far as regards the leaves and stem; be that as it may, the plant becomes discoloured in a great or less degree; the leaves and stalks soon fall, becoming rotten and particularly offensive; the roots, after showing spots in the skin, gradually decay, and in the change become dark in colour, mucilaginous or gummy in condition, and finally become a putrescent mass. These changes take place with greater or less rapidity according as other circumstances promote or retard the action.

In assigning a cause for this disease, I am disposed to accept that given by Professor Way, viz., that the sap of the potato when exposed in the leaf to the atmosphere became altered in its character by the atmospheric agency producing the disease. As this altered sap passed through the plant, so it carried with it the elements of decomposition which produced the results described above. To enable the general reader to understand this as clearly as possible, I must give some explanation of the composition of the potato. The root contains a very large proportion of starch, which is the natural supply of food for the plant's early growth. The eyes or germs of the potato, which are observable upon the surface, are the points from which the new plant springs. When these germs are about to grow, food is necessary for enabling them to exercise the energy of life; but as the root consists chiefly of starch, which is not capable of entering into the plant, Nature has provided for the formation of a decomposing agent (which is known as diastase) around the germ, and this body changes the starch of the potato into gum or sugar, in which form it is useful as food for the young germ. This powerful agent is formed in other seeds, and the value of the process of malting barley depends upon its formation. The reader will probably be more familiar with it when I say it is a body which is produced in malt, and which is its active principle or real strength. Naturally, this is formed only around the germ of the potato, but Professor Way discovered that the disease caused it to be formed *throughout the plant.* We are all aware that *cold* can so alter the composition of some portions of the potato as to produce this agent throughout the root. This is quite unnatural; for in the healthy growth of the potato this body is only found around the germ or eye, and never throughout the root. To prove that cold will effect this change, I need not give you any stronger proof than the influence of frost upon potatoes. When potatoes have been exposed to the frost, and they are afterwards boiled, they become sweet to the taste; this sweetness is due to diastase having been formed, which has turned the starch into sugar. This chemical change which occurs in the root is known to have been produced in the growing plant by the disease, and this is the earliest effect observed.

The presence of this active decomposing agent is enough to account for all the changes which naturally occur. The plant has thus been charged with the elements of decay, and it only needs favourable circumstances to develope the destructive powers which are hidden there. It is well known that moisture and warmth caused rapid decay; but when the roots were kept dry and cool, they remained good for a longer period than usual. As soon as this agent was formed in the sap, it was diffused by the circulation going on in the plant, and thus became generally distributed. This early formation also accounts for the disposition to sprout which has been manifested so much earlier than usual. We may also gather another explanation as to the opposing opinions held, whether the stalk or the leaves first become affected. The change was without doubt produced in the sap as it circulated through the leaf: if its movements happened to be slow, the leaves would probably be the first to show signs of decay; whilst if the motion was rapid, the sap would pass on into the stem, and there commenced its decomposing influence.

This view of the case is somewhat confirmed by the fact that *the potato disease has been produced artificially*, as recorded by Mr. Graham in the *Journal of the Royal Agricultural Society*, vol. vii., page 372. It is also worthy of notice that Professor Way showed that potatoes might appear perfectly sound, and yet if this agent had been formed they were sure to give evidence of the disease. Thus, in some cases, under careful management, the diastase was kept inactive for months in those roots which were preserved cool and dry, whilst to all appearance they were free from disease. After the tissues of the plant become acted upon, and their decay has commenced, then fungi and animal life come under observation; but they never precede the chemical change already described, and must therefore be looked upon as subsequent results of still later occurrence, and certainly not in any way the original cause of decay. This explanation of the disease appears to my mind clear and simple, and it does not need the adoption of any novel views, for the results are traced to the action of a decomposition arising from chemical changes produced in the sap by atmospheric agency.

This is a very brief description of the potato disease; and now we may notice the means adopted to prevent its occurrence; but this embodies the general management of the crop. The entire system of culture has now for its primary object to avoid this disease, or to mitigate its attack. There are no special means adopted to prevent this disease, but such as come under our notice in the management of the potato crop in different districts, to which I now draw your attention.

The culture of early potatoes for the London market is a special branch of the practice, and needs very particular management to ensure success. Three conditions appear necessary for success: a favourable climate; a dry, friable, and fertile soil; combined with good management. The districts most noted for this description of potato are Cornwall and Lancashire, and in each of them proximity to the sea is of essential importance. The reason for this is that the temperature near the sea (especially on the western side of England) is less subject to variation, and the plants growing in these neighbourhoods are thus protected in an unusual degree from the influence of frosts. Temperature is, therefore, the chief influence which gives superiority to these sea-side districts.

The character of the soil is as important as the climate, and the first condition is that the soil must be loose and friable. For this reason, the granite and greenstone soils of Cornwall, and the red sandstone soils of Lancashire, from possessing these characters, are very favourable for encouraging a free and unrestrained growth, and enabling the roots to spread freely in search of nourishment. Dryness of the soil is equally necessary; for in like manner as wet soils are cold, so also are dry soils warm, and this warmth is of extreme importance for producing growth in the spring. The influence of the sun upon sandy or gravelly soils is also very prompt; and in this manner the plant receives powerful supplies of this stimulant to growth. The last condition named, or the fertility of the land, is a manifest necessity; for rapid growth needs a liberal supply of food, and such as only fertile soils can yield. Thus the character of soil required embodies all those qualities which regulate luxuriance of produce; and when these are available under a favourable climate, then we have a soil suited for the growth of very early potatoes, and of course worth a very high rent. The rent in the districts already named range from £10 to £15 per acre, and even at these prices the land yields very profitable crops. I am now only referring to the earliest class of soils, such as are found near Penzance and Morecombe Bay.

There is a great difference in the management of these two districts. In Cornwall, the general plan is to dig the ground by hand in autumn, and plant the sets in drills as the ground is dug; thus the earth dug from one drill is cast into the former drill. The early kidney potato is the variety grown; these they plant as early as October and November. After the sets are dropped, some earth is thrown over them; and then the manure being spread in the drill upon the seed, it is ready to receive the earth dug in the preparation of the next row. The manure preferred is a compost of farm-yard dung and sea-weed, &c. Nothing more is done to the crop until the spring, when the ground is flat-hoed in March. Potatoes thus treated are dug early in April, but the general digging commences in May.

In Lancashire the system is different in many respects. The ground having been ploughed in the early parts of the winter, receives another ploughing in January or February, dry weather being carefully and promptly seized for this work. After this the manure is got ready for being used by being well rotted, for which an occasional turning is necessary. At the end of March, or very early in April, the manure, which is then thoroughly rotten, is cast over the ground, and the plough follows immediately. Some farmers then harrow the ground, and plough again. With this preparation the potatoes are dropped in drills made by hand labour, as already described, and covered with soil taken from the next row. The manure used is somewhat similar to that employed in Cornwall; sea-weed and sea-sand are here also mixed with farm-yard manure, and valuable indeed they are as fertilizers of the land.

There is one point particularly worthy of notice in the Lancashire system, which is, the great care taken with the potato sets in preparing them for planting, a practice worthy of more general adoption. In January the seed is brought out and spread upon floors, where it will be warm, so as to encourage a growth of the germ or sprout. Rev. E. F. Manby, in a valuable communication to the Royal Agricultural Society (*Journal*, vol. xviii. p. 407) upon the growth of early potatoes, says, "The cottagers bring their potatoes into their houses, and place them under their beds. When these recesses are filled, they fill small baskets of the same kind as those from which the seed is planted, and hang them on hooks to the ceiling of their apartments downstairs, to obtain the advantage of the warmth of the fire, and then proceed to fill every possible place where they may be kept from the frost. If a man possesses a cowhouse or stable, the rafters are forthwith adorned with hooks, and the little baskets suspended. One of the largest cultivators has converted his hay-lofts over his horses and cows into sprouting-rooms. Above these lofts he has laid a second floor, so that he is enabled to sprout double the quantity. The warmth arising from the cattle has been proved to be quite sufficient to keep out the frost. Care, however, must be taken that the sprouts do not become blanched and weak: they must have plenty of light. The tubers should not be placed thicker than two inches deep, or the root will become one mass of sod."

The sprouting of the potato before planting is an essential part of the system, for without this progress being made it were impossible for them to dig the crop in eight or nine weeks, as they usually do; and thus by the middle of June realize generally about £50 per acre for the produce. Besides the preparation in the sprouting, *very great care* is taken to secure lemon kidneys, and of the best quality. This is a variety without an equal for rapid growth and early maturity. After the crop is planted the work is entirely done by manual labour, consisting as it does of hoeing and earthing-up.

Whilst we must bend to the results of successful practice, as indicating a correctness of procedure, I think we may venture to say that both of these systems offer valuable hints. Excellent as the Lancashire plan is, it is just possible that if they copied from the Cornish plan, and planted in the autumn, they would have their crops ready earlier. The modification should only be introduced by way of trial; for as the more northern climate of Lancashire is colder, it may be that even proximity to the sea cannot sufficiently protect the crop. The influence of frost may, however, be very much diminished by additional earthing-up. Such are the advantages of having the crop even one or two weeks earlier, that any plan which offers the probability of rendering the produce earlier should be fairly tested. On the other hand, the Cornish growers may take a lesson from their competitors, by exercising equal care in selecting their seed, so as to prevent any degeneracy.

Nor are these the only persons who may derive benefit from the systems adopted. The superior value of these crops is a strong inducement to their growth, and there is no doubt but that many other farmers have land suitable for adopting this system. Along the extended line of coast possessed by the western side of England there are, doubtless, many spots of land which, if not equal to the Penzance and Morecomb Bay districts, may still, under good management, be made to approach very closely, and produce highly remunerative crops. The soil must be dry, friable, and of good quality; and especial care should be taken in obtaining good seed.

The management of the main crop of potatoes offers many points of contrast from the foregoing; for whilst only special districts are suited for the production of early potatoes, almost every occupant of land is a grower of this crop. In Scotland and the North of England we find the largest and best cultivators of the main potato-crop. A corn-stubble is generally selected, and this being cleaned is deeply ploughed before winter; and if it should be strong land, it is carefully laid so as to throw off the surface-water. Early in the spring it is ploughed, thoroughly well harrowed, and again ploughed; in which state the land remains until the middle of March. The manure, which has been previously drawn to a convenient spot, has also by this time become well rotten. The land is then thrown into drills twenty-seven inches wide, in which the dung is spread, the potatoes dropped, and immediately after the ridge is split and the planting completed. The varieties chiefly grown are Scotch duns, Perthshire reds, Fifeshire regents, Perthshire rocks, and Scotch cups.

When the potato is growing, care is taken to keep the ground clean, the plants well earthed up, and the furrows deeply stirred; and thus additional mould is prepared for the next earthing. A thorough earthing up of the crop is looked upon as an essential element of successful growth. A similar system is carried out in different parts of England—in Yorkshire and Lincolnshire especially. In the two latter districts, the regents and fluke potatoes are extensively grown. An immense quantity of potatoes are shipped from these districts to the London market, which receives its main supply from this source.

The West of England was at one time a successful competitor in the London market, and the exports from Devon and Cornwall were surpassed by none. Since the potato-disease commenced, this trade has gradually declined, until it has been brought into a very inferior position at the present time. The granite and sandy soils of these counties have long been noted for the quality of the potato grown, and some parishes around the granite hills especially so. The moisture of the West of England climate, and especially its liability to fogs and mists, has operated as a great stimulus to the disaese, and thus checked the cultivation of the potato. Now, however, that we have become so familiar with the disease, and have learnt the best plan to mitigate the attack, we may hope that this profitable branch of husbandry will again extend.

The practice adopted in some cases corresponds with the northern system, but the majority after the second ploughing spread the manure upon the land and plough it down, dropping the potato in every third furrow, so that the land remains flat. After the potatoes can be seen, the openings between the rows are well hacked over with a digger or two-bill, and thus a nice soil is prepared for earthing up the crop. In some cases the old-fashioned lazy-bed system is practised, and often with singular success. The plan is to spread the manure on the land, and then throw it into narrow beds about three or four feet wide. In these beds the potatoes are planted simply by the use of a dibble, and the only care required is to cast upon the bed the earth from the rather wide furrow between the beds, and sometimes also to hand-hoe it slightly. Dr, Lang, in a very useful paper on potatoes, in the *Journal* of the Royal Agricultural Society (vol. xix.), attributes the success of the lazy-bed system to the fact that in hoeing and earthing up the crop the minute tubers which are being formed between the rows are cut off, whilst on the lazy-bed plan they escape.

There is nothing objectionable in the lazy-bed plan if it be carried out with proper judgment. Indeed, I think we may secure its advantages without the disadvantages which are too generally connected with the neglectful management adopted, and hence the name given to it—the lazy-bed method. We may, however, practise the bed culture with success, and by our good management show that the prefix "lazy" is inconsistent. As an improvement upon the bed system I should recommend a corn-stubble to be well cleaned immediately after harvest: the dung should then be spread and ploughed into the ground. As early in March as the weather will allow, let the ground be well scuffled, and then ploughed into beds three or four feet wide, with half the width between the beds. In these beds let the potatoes be planted, and throughout the season kept *lightly* hand-hoed. The earth in the furrows to be cast on the beds as the potatoes make their growth. Thus the foulness of the land, which is a cause of complaint against the old plan, may be avoided. It would be a very great improvement to apply some lime just before the land is scuffled in the spring. Its influence upon the land, and especially upon the dung already in the soil, will not fail to be most desirable.

The varieties chiefly grown in the western districts of England, are the early top, ash-leaf kidneys, American early, regents, forty-folds, and Cornish kidneys; and each of these varieties is of good quality, but varies in time of ripeness and also in suitability to different districts. In the midland counties, in addition to some of the foregoing, the lapstone kidney, walnut-leaf kidney, round ash-leaf, red-eye, and flukes are favourite kinds. Much of the value of every variety depends upon its early ripeness. Experience has shown that those varieties which are the most perfect when the disease appears are the least affected by it. It is reasonable that such should be the case; for as the tubers become ripe, so do they cease to receive supplies of sap from the stalk; if, therefore, they are not receiving sap from the stalk, it is clear that they cannot receive the altered sap which is the cause of decay, and the first influence of the disease. Everything should therefore be done to get the crop ripe as early as possible, and the careful selection of early seed will be one means towards the accomplishment of this result.

This disease I have described as resulting in a decay of the organic matter of the plant. Now, a moment's reflection will show that fermenting matter when used as a manure is likely to encourge this decay, whilst an antiseptic manure would have an opposite tendency. This quite accords with the evidence of potato growers, for dung when applied at the time of planting the potato, and especially if used rather long, is sure to encourage the disease, and the crop becomes more rotten in consequence; but if, on the other hand, lime, or lime and salt are employed, the growth is encouraged, whilst decay is checked. When it is desirable to use dung for potatoes, it should be ploughed into the ground before winter, and in the spring incorporated with it. After this no fear need be entertained of its producing any ill effects, but it will stimulate the growth of the crop and increase its produce considerably.

The use of lime in the spring will always prove a desirable addition. Guano is often employed as a manure for potatoes, and the usual plan is to sow it broadcast upon the ground, after it has been cast into ridges: the potatoes are then planted in the furrow, and the ridges split. This is probably as good a way to use guano as any, when ridges are preferred; but when potatoes are planted in beds, or when ploughed-in on the flat, I should rather be disposed to mix the guano with some ashes, and sow over the ground after the planting is finished—damp weather being chosen for doing it.

Before leaving this notice of the manures used for potatoes, I must not overlook the great value of sea-weed. If those who can get these supplies from the sea-shore fully appreciated its value, it would be more regularly used than it is at present. It has a peculiar value for potatoes, in checking the tendency to and the progress of the disease. It may be used in its fresh state; but it is far more effective when mixed with farmyard dung, and both allowed to rot together. Manures, as they may be selected, prepared, and used for the potato crop, offers great opportunities to the potato grower, and by their judicious employment they will materially assist him in accomplishing the great object he has in view—an early and abundant crop.

Another point well worthy of attention is the sprouting of the seed, which I have already described as being done in Lancashire. In this way much progress may be made before the potato is planted, and this will have its influence upon the time for raising the crop. I am well aware some difficulty and trouble attends its adoption on a large scale, still this must not stop its more limited adoption; and when its advantages are fully known, it will remain with each individual to extend its adoption on a larger scale, as may appear to be desirable. So long as there is any tendency to disease, so long must we use every endeavour to secure early crops. Whilst we are noticing the selection of seed, I must draw attention to the connection existing between the seed and its produce. For a considerable time it was imagined that the produce of diseased seed was more predisposed to disease than crops grown from the perfectly sound and healthy seed. This opinion is not held only by a few. Viewing the disease as a purely chemical change or decomposition produced in the potato (by some cause not definitely known), and that this change occurs naturally in healthy seed during its growth, although at a less rapid degree, there does not appear to be any just cause for considering that the character of the germ could be prejudicially influenced thereby, except as regards its supply of food. If the decomposition had proceeded so far as to cause the waste or removal of the nourishment, it is clear that the germ could not come to maturity, not from any tendency to disease it had received, but from a want of proper food to enable it to grow.

Mr. Thompson, of Moat Hall, Yorkshire, published some interesting experiments which he tried before the general appearance of the potato disease, which are remarkably instructive. The following table presents, in a condensed form, the results of these experiments, as recorded in the Journal of the Royal Agricultural Society, vol. vi., p. 165.

ROUND REDS.

Year.	Seed taken up.	Quality of crop.	Quantity of crop.
1840	Ripe, supposed	Curled	Failing crop
1841	Unripe	No curl	Good crop
1842	Unripe	No curl	Good crop
1843	Ripe	Curled	Indifferent
1844	Unripe	No curl	Good crop.

BLACK KIDNEYS.

Year.	Seed taken up.	Quality of crop.	Quantity of crop.
1841	Ripe, supposed	Curled	Failing crop
1842	Ripe	Curled	Light crop
1843	Unripe	No curl	Capital crop
1844	Ripe	Much curled	Very bad crop.

These facts show most clearly (and they are confirmed by other experiments) that for the production of an abundant crop it is quite possible for the seed to become too ripe. How this arises we may not be able fully to explain; but it is certain that when a potato has reached that stage which we denominate fully ripe, and indicated by its being mealy and flowery when boiled, that the tissues have become less firm and less nutritious than when they were less advanced, and consequently advanced appear soapy and close after cooking.

Cultivation may be looked upon as an artificial mode of forcing the growth and development of a plant, and the management of our potato crop has always been of this character. It would for this reason appear as if in our cultivation of the potato we generally produce an over-grown seed—a tuber which has been forced so much that its tissues have lost strength, and this for the purpose of table use. We must carefully distinguish between this over-growth and ordinary maturity or ripeness. The latter term, *in its true application*, can never be unfavourable to any seed; but we have habituated ourselves to use the term "ripeness" of the crop to indicate maturity for table use, rather than that earlier stage at which the tuber possesses greater strength and vigour.

It would for these reasons appear necessary to select seed in an earlier stage of growth than that prepared for table use. To attain this result we must either obtain the potatoes from poor and heavy land, where the growth has not been forced, or else to plant potatoes late, on purpose to produce the seed required. The choice lies between these plans, and that of digging the seed from the general crop before it is ready for raising. The latter plan is found to be objectionable on account of the tendency of the seed to sprout before it is required. It may, perhaps, be said that these experiments only record the influence of the seed upon the curl in potatoes, and not upon the potato disease with which we are all too familiar. Mr. Thompson, in the article already referred to, says, "The experience of this season convinced me that curl, dry-rot, and wet-rot, are one and the same complaint; that curl is a mild attack of the disease, which, when violent, destroys the set before it can germinate, and that it assumes the dry or wet rot according to the degree of moisture of the soil or season." To this I would add, that the present disease is believed to be only an aggravated form of the same complaint. The results are similar, but rendered more certain by the presence of the decomposing agent, as already explained.

In a recent communication Dr. Lang advances the opinion, that "the disease is in exact ratio to the proximity of the tubers to the surface, and he gives several singular proofs. One experiment may be recorded here to illustrate the preservative power of soil: "On Sept.

18th, 1857, three pits were made, ten inches deep, and about the same in diameter. Three white kidneys were placed horizontally on the bottom, and just covered with a little fine earth; and then another layer, similarly covered; and then a third layer; so that the whole consisted of three layers of potatoes, with just earth enough between to keep them from touching each other, and the uppermost layer about two and a-half inches under the surface. A few diseased leaves and stems were placed on the pit No. 1, and then watered with half a small garden-pan of water, with a fine rose; pit No. 2 was watered with the remaining water; pit No. 3 had a large slate put on it:

Sept. 28th, 1857, No. 1 pit had each of the three upper potatoes slightly affected.
Jan. 23rd, 1858—No. 1. Three upper potatoes quite rotten.
No. 2. Three upper much affected.
No. 3. Three upper not diseased.

In all three pits both the under-layers were free from any taint." The subject is very fully noticed by Dr. Lang in the *Journal* of the Royal Agricultural Society (vol. xix. p. 77), and well worthy the careful perusal of those interested in the cultivation of this useful crop. He also states that in the digging of a considerable quantity of potatoes, none of those tubers covered with more than three inches of soil were found to be diseased. This is in some degree confirmed by the success resulting from the excessive earthing of potatoes practised in some parts. It is certainly a very gratifying fact to learn, and worthy of being taken advantage of in our practice.

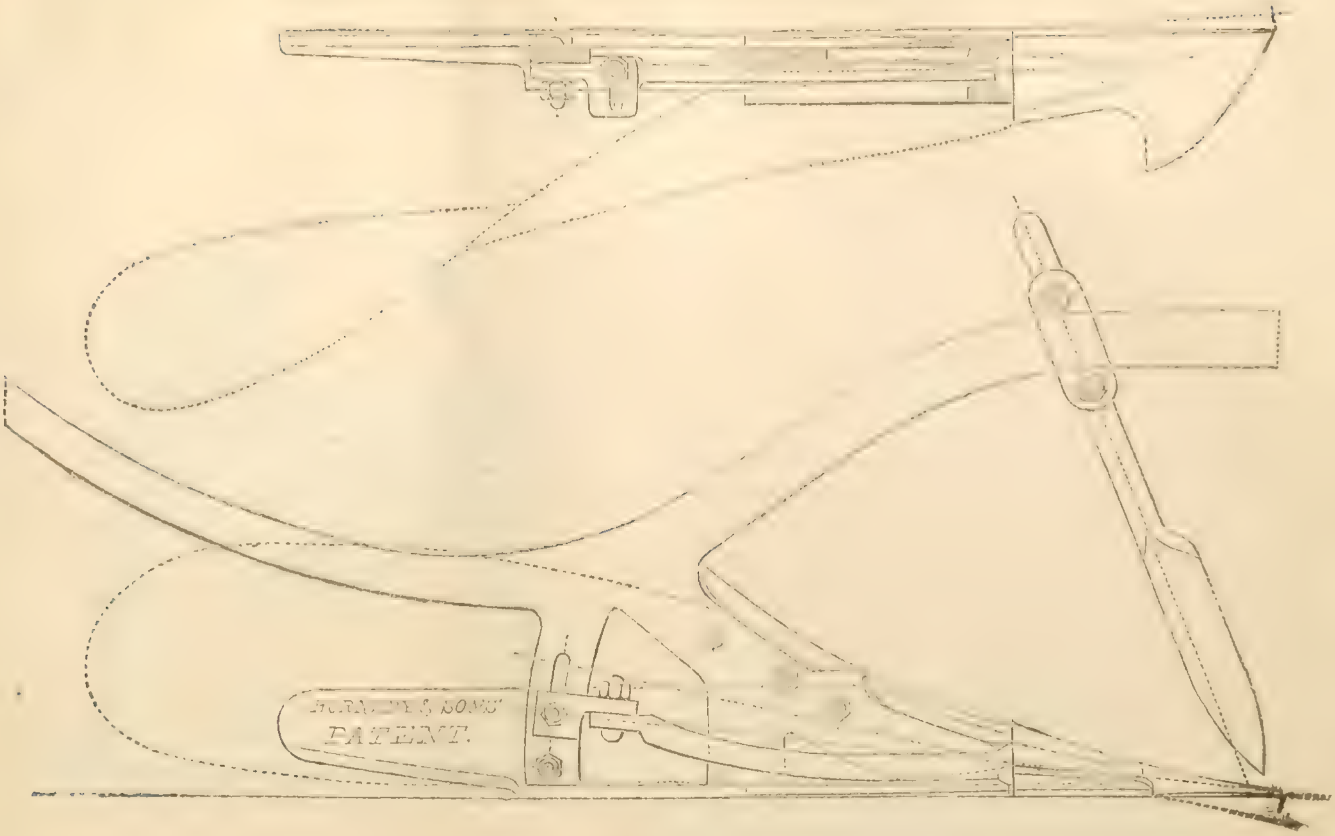
The crop having been produced, we have to take the necessary precautions for its preservation. The tubers should be raised in dry weather, and should also be dry when put into the cave. In making the cave, a dry spot of ground must be selected, and a double row of four-inch drain-pipes should be laid along the bottom, so as to assist in ventilating the heap and carrying away the moisture arising from the stock. The heap should be brought to an apex, and continued in length according to circumstances, but it should not be more than five feet wide at the base. At intervals small bundles of reed or straw (say six inches in diameter) should be placed from the bottom to the top of the heap, and then passed through the thatch. In this manner the air enters by the drain-pipe and ascends through the stack, carrying with it the sweat from the roots, which if kept in would very much promote their rotting. When the frosty weather comes, these apertures may be stopped up. There should be a trench around the potato cave, so as to keep it perfectly dry.

A RETROSPECTIVE GLANCE AT SOME OF THE IMPLEMENTS EXHIBITED IN THE GALLERIES AT THE SMITHFIELD SHOW, DECEMBER, 1859.

It has been our pleasant duty, for some time back, to present to our readers descriptions of the implemental novelties at the leading exhibitions of our agricultural bodies. It has always been our aim to make these descriptions more detailed in character, than these in the usual newspaper report, which are of necessity drawn up under a *pressure* of time, which hinders greatly, all attempts to examine closely the mechanical details of the implements presented to the notice of the reporter. From this detailed review many advantages of a practical character are obtained, too obvious to need mention here. Several circumstances have conspired to prevent our presenting the descriptions of implements so soon after their exhibition as has been our wonted custom. This delay, however, will not be prejudicial to the real interests of the subjects discussed, for this advantage will certainly be obtained by it—we are now approaching rapidly the period of the great Canterbury gathering, at which many of the implements we propose to describe will likely be exhibited; so that our decriptions now may serve to introduce them to the notice of our readers, who will likely attend the great show, and tend to familiarize their minds with their peculiarities, so that all improvements effected since their primary exhibition may at once be noticed and noted down. It helps greatly towards the practical examination of the actual machine to have been previously made acquainted with its peculiarities through the medium of a mechanical description. It is practically lengthening out the time which may be devoted to an examination of the leading features of the show yard—a matter of no small moment when one's time is all too short for the magnitude of the task of examination which the show-yards of the Royal Society now yearly impose upon visitors.

Although crowded to an extent which put the squeezable power both of implements to be seen, and of the crowds who rushed to see them, to the utmost test, the implement galleries of the Smithfield show of 1859, presented a somewhat marked, and may we say novel, absence of novelties. Formerly we have had so many new things presented to our notice, that the task of examination has been a somewhat heavy one; last year, the select few exhibited made the duty comparatively light. Although, however, the novelties exhibited were few in number, they were important in character, and to a description of them we now direct the attention of the reader.

Although exhibited at two of the great exhibitions of the year—the Warwick and the Edinburgh Shows—and consequently barely meriting the name of a novelty, still we venture to class it as such, and give a description of Hornsby's Patent Plough. Of this we present two illustrations, taken from our "Year Book of Agricultural Facts for 1859" (Blackwood), one being a side elevation, the other a sectional plan. From these, with the following details, some notion may be obtained of the arrangement and construction of its parts.



In this plough, the mouldboard is attached to the sole or slide, in place of being connected with the frame or body, as is usually the case; this arrangement enables, amongst other advantages obtained by it, the beam, the handles, and the body to be made of wrought-iron, and all in solid pieces. The end of the lever neck is made spherical, and passes into a corresponding hollow part made in the front part of the sole. The junction of the two is so complete that, although the easy movement of one within the other is secured, no dirt or extraneous matters can obtain admittance, to clog and interfere with the action of this most important part of the plough. A conical opening, wider at the end nearest the handles than at that nearest the coulter, is made in the frame; through this the lever of the lever neck is passed, and is allowed, from the conical-shaped aperture, free movement in every direction, laterally as well as vertically. The lever is carried backward towards the handles, and is attached at its further extremity to a snug fixed to the frame or body of the plough. This snug is not a fixture, but is provided with a bolt and nut, which secure the snug to, and allow it to work up and down in a curved slot or opening made in the framing. This curved slot is of the same radius as a circle described by the outer end of the lever of the lever neck, the centre being its centre of working in the spherical hollow of the slide or sole. The result of this arrangement is a means of giving any required degree of vertical adjustment to the "share," which is attached to the lever neck, so as to give it more or less inclination to the soil; and this is simply effected by fixing the movable snug—bearing the end of the lever—at any desired point in the curved slot or opening. A lateral adjustment of the lever, however, is also required, so that the lever neck and the share attached to it shall have less or more inclination to the land side as desired. This, again, is simply effected by giving to the movable snug a flat upper table, in which a slot or opening from side to side is made. A bolt connected with the end of the lever of the lever neck passes through this slot, and is secured by a nut resting upon the table of the snug; by loosening this nut, the bolt, and with it the lever to which it is attached, can be placed in any part of the slot of the snug, and by tightening up the nut there retained.

By these arrangements any degree of vertical adjustment (share with more or less inclination to the soil), and of lateral or side-adjustment (more or less inclination to the land side), may be easily made.

To secure an ease of draught and a facility in keeping the plough working in a right line, the land-side of the plough is made longer than the sole or slide; the hard pan or sole made in the bottom of the furrow is thus reduced to a minimum.

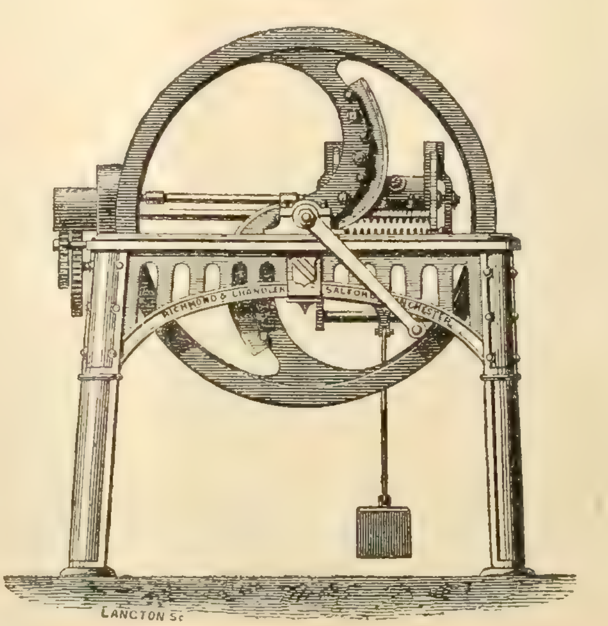
In the department of cultural implements now under consideration, Messrs. Crosskill, of Beverley, exhibited the Revolving Harrows (Marriott's patent). Two circular harrows are joined together by a connecting bar, jointed with an eye to the central bar of each harrow. To the central bar, links are jointed; and these, provided with shackles, are adjusted to the whipple or swing-trees. By this arrangement, the harrows are capable of adjusting themselves to any inequality of surface and to any irregularity of draught. The giving-and-taking motion, so to speak, produced by the irregularities of the surface acted upon, produce a rotatory and cross-action of the harrows, taking a firm hold of the earth, and giving, it is said, a peculiarly fine tilth.

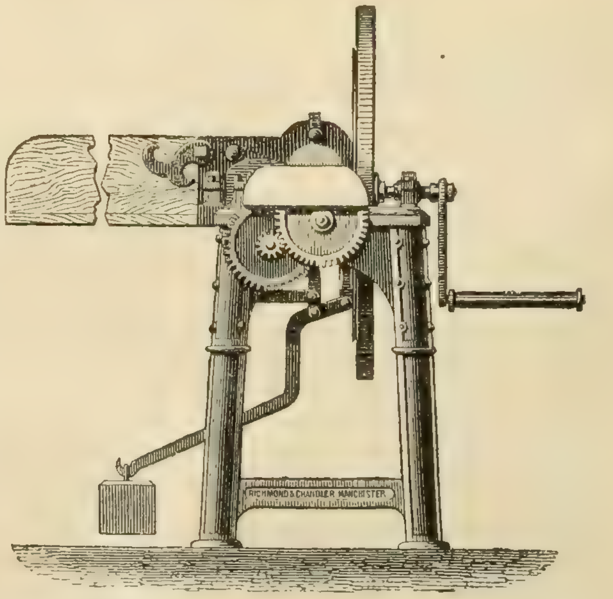
Each harrow is composed of two concentric rings of wrought-iron: these rings, being placed horizontally carry the tines or teeth.

Messrs. Owen and Co., of Tottenham Court-road, exhibited in this section of implements an American "potato-digging plough and cultivator," possessing many of the features which characterize American field-implements. The share is broad, short, and made equal-angled in front, terminating in a point. It is carried by a curved stem connected with the beam, the front of which is supported by two small wheels. Behind the share and stem, bars project some distance. They are placed angularly, pointing upwards; and their office is to disintegrate the soil, which is passed up to them by the action of the share, separating the earth from the potatoes, leaving these lying uppermost as the plough progresses. The implement looks as if its arrangement was founded upon that modification of the plough which in Scotland is used for splitting up the ridges, and which has a "brander" behind, for separating the potatoes.

We now come to describe the "machines of realization" as they may be termed, those which have connexion with the preparation of the food for stock or of the grain for market.

In connexion with the food-preparing mechanism, Messrs. Richmond and Chandler exhibited specimens of their chaff-cutting engines, with their recently patented improvements; these exemplifying in the nice adjustment of parts and their admirable workmanship, the high perfection to which the construction of agricultural mechanism has been brought by the exercise of constructive skill and mechanical ingenuity. The patented improvements in these machines consist, first, in the adoption of means by which the upper feed rollers are supported in adjustable bearings, so that each roller is enabled to rise and fall independently of the other; second, in making the teeth of the first pair of the rollers tapered and radiating from the centre; third, in making the mouthpiece of the machine of cast steel, so that it remains uninjured by the repeated action of the knives against it; fourth, an improved mode of fitting the knives. The bottom feed rollers are supported in fixed bearings, while each upper roller has an independent bearing: links are suspended from the axles of these upper rollers, and are jointed to a beam from which is suspended a weight. The improved radial and tapered form of teeth of the first pair of feed rollers causes them to take a better hold of the material as it passes through between them, conveying it with regularity to the second pair of rollers, the teeth of which interspace with those of the others, and strip them of the straw. The knives are adjusted to the face of the mouthpiece by setting them at an angle to the face of the fly wheel. A number of projections or studs are stamped on each blade, the outer faces of these projections being diagonal to the blade, and in line with face of flywheel. Screwed bushes, furnished with hexagonal heads, fit against these projections, and are screwed into the arms of the flywheel. The knives are firmly secured by bolts which pass though the bushes and projections. To adjust the cutting edges to the steel mouthpiece, the nuts of the bolts are slackened, and the bushes turned in the direction required, so as to bring the cutting edge of the knives nearer to or further from the steel mouthpiece; when the adjustment is made, the nuts are tightened, and the whole held in place. We give illustrations of this machine—front and side elevations—



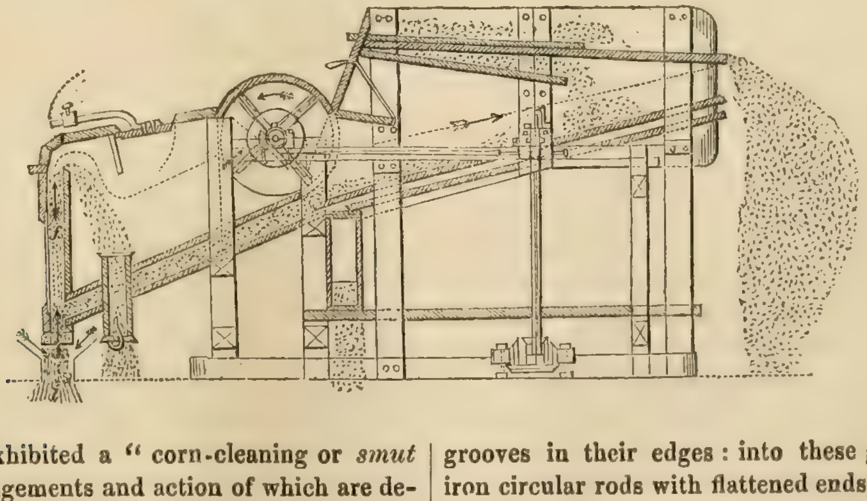


Messrs. Edward Palmer and Son, of London-road, Thetford, Norfolk, exhibited a straw-cutting engine, in which were noticeable several features of novelty. The principal of these is the substitution of straight-edged for the usually curved-edged cutting knives. They are not attached to the flywheel arms, but to the flywheel shaft. They are placed not exactly parallel to this, but with one end slightly in advance of the other: this insures the knives giving a "drawing cut," like a razor. The knives thus set, form a cylinder with several cutting edges running across the inner-end of the feeding-trough: this terminating in a fixed bar set at an angle with the revolving cutters. This bar forms a stationary cutter, the material to be cut passing between this and the revolving cutters. By means of set screws the knives can be easily adjusted to, or taken from, the cylinder for repair, &c. Straight-edged knives certainly possess this advantage of being easily sharpened, and new ones made by country mechanics to replace those which may be broken.

In corn-cleaning apparatus, Messrs. Ransomes and Sims exhibited a "self-cleaning and adjustable rotary screen," which displayed features of considerable ingenuity and efficiency. The frame of the machine is of cast-iron, and carries the hopper into which the corn to be cleaned is put, and the rotary cylinder through which the corn is passed while being cleaned. The frame is carried by two wheels, and a foot is provided at front, which supports it when at work: two handles afford facilities for wheeling the apparatus from place to place as desired.

The axis of the revolving cylinder is placed at an angle, giving the grain passed into the cylinder a tendency to pass from the upper to the lower part. The gradual descent of the grain, combined with the rotary action of the screen, turns it over and over, and keeps it in constant motion as it passes through the cylinder. The cylinder, strictly speaking, is made up of two separate cylinders, one within the other. Each cylinder is made up of two circular ends, joined by six longitudinal ribs, the spaces between which are filled up by spiral threads, or coils of wire. The smallest cylinder moves upon independent centres: these are adjustable, so that by moving them the two cylinders are brought to a greater or less degree of eccentricity to each other. This adjustment is made by means of a handle working a small double eccentric. Thus, while the wires at one part of the cylinder are on the same plane, that is perfectly flush with each other, at the opposite part of the screen they are at the greatest distance apart, one set projecting beyond the other, this distance being equal to the difference between the diameters of the cylinders. On the grain to be cleaned being put into the hopper, it passes from thence and into the interior of the cylinder, both of which partake of a similar motion, at the points where the wires of both cylinders are in the same plane or flush with each other: the large grains would pass over to another part till they come to a part where, by the increasing eccentricity of the two cylinders, spaces large enough to let them pass would be met with, through which they would fall. By the proper adjustment of the two cylinders any required degree of opening between the wires may be obtained.

Messrs. Owen and Co., of Tottenham Court-road, exhibited Child's corn-dressing machine, of which a short description and illustration may be acceptable. The action of this machine is two-fold: in the first series of operations the grain is subjected to the combined action of the blast and the reciprocating riddles; these clear the grain from the small seeds and from the larger foreign substances with which it is too often mixed. The principal peculiarity in the part of the machine carrying out these operations is the form of the surface of the upper riddle, by which the substances larger than the grain are passed from it and delivered to the spout. In the second and final operation, the grain previously cleaned and sorted according to size, is subjected to a second test, namely that of weight or gravity. The grain as it passes from the last fine riddle is delivered into a pipe or tube, up which a strong current of air passes, to supply the fanner which cleans the corn in the first series of operations. By adjusting the strength of this current, the grain which is too light is carried away and deposited in a chamber, from which it passes off by a spout, while the heavy grain falls down and is led off where desired. The nice adjustment necessary to secure the proper strength of current, so that the proper selection of grain is made, is obtained by the use of a self-adjusting valve placed at the entrance to the chamber. By the use of this valve the irregular motion of the fan does not affect the uniform strength of the exhaust current.



The same firm exhibited a "corn-cleaning or *smut* machine," the arrangements and action of which are deserving of notice. The apparatus consists of a tall cylindrical vessel, into the upper part of which the corn is delivered, passing out cleaned at the lower. The cylinder is not in one length, but is made up of four sections, with a lower chamber. Each section is composed of two rings bolted together, and provided with grooves in their edges: into these grooves a series of iron circular rods with flattened ends are placed, leaving spaces of 1-10th of an inch between them. The outside of the tall cylinder is thus composed of horizontal rings with vertical rods between them. Each ring carries on its lower edge a ledge which projects inwards at an angle of 45 degrees, the upper surface of which is ledged or corrugated. The cover of the cylinder is corrugated on its under side. A central shaft passes from top to bottom of the cylinder, carrying at intervals corresponding with the position of corrugated ledges, a series of circular plates, the upper surfaces of which are curved and corrugated, so as to correspond with the curve of the ledges of the rings. From one plate to another a series of vertical rods pass, these forming a circle of nearly the same diameter as the plates; the plates carry also on the under sides small fan-blades. By the arrangement adopted of beaters and fans, a very large amount of scouring surface, and by the use of the projecting ledges a repeated action on the grain, is secured. The space between the rods forming the outer case admit of the passage of all impurities as soon as they are generated, by the immediate action of the fan-blades. The action of the machine is thus: On the grain entering the top chamber, itf alls upon a revolving corrugated plate, receiving a thorough scouring between it and the corrugated surface of the ledge. The angular set of this ledge throws the grain towards the centre of the apparatus, and causing it to fall on the middle of the second corrugated plate, in its passage downwards receiving the beating action of the fan-blades and of the vertical iron-rods which pass between the plates; the impurities being expelled by the action of the fan. These processes are repeated in each of the chambers, till the grain is finally delivered clean and free from smut at the lowest and last. R. S. B.

THE VINEYARDS OF LA BELLE FRANCE.

We are now off to the vineyards of Gascony and Guienne. From the terminus in the Boulevard de l'Hôpital, near the Jardin des Plantes, the train soon throws us through the valley of the Seine, whose vine-clad slopes afford a very pleasing picture. Had we made our way to Orleans by the old road, we should have crossed the waving corn fields of the famous plain of La Beaunée, an object of interest to an English farmer. Passing the site of "the Battle of the Herrings," and that of the flight of Sir John Falstaff from the pursuit of the Prophetic Maid, we reach the declivity of the Valley of the Loire, where is situated Orleans, in the neighbourhood of fossil remains of gigantic quadrupeds discovered in the freshwater limestone. Getting into conversation here with an agreeable, well-informed companion, he tells us that the prices of land in vineyards varies considerably throughout Touraine. At Petiviers, for instance, which lay on our left, the price per English acre is £35, and the produce £8 per acre; at Chambord £25 per acre, and the produce £8 8s.; while at Amboise the produce usually reaches £5 12s. per acre, and the price of land £43. At Chambord, involving a convenient little excursion from Blois, we find about two thousand acres of vinery, and all under the eye at once, upon a blowing sand. Quitting Orleans—more celebrated for its historical traditions in connection with the wonderful Joan d'Arc, whose inspiration should always be insisted upon by the English for obvious reasons, than for its present commercial enterprise—the railway conducts us, to our great satisfaction, along the right bank of the Loire. The valley is broad through which we run, varied by moderately high hills, and the scenery to Tours is charmingly sunny. The separation of breeds of cattle made by this river strikes the stranger as remarkable. They are cream-coloured and blackish, with Norman mixture. The land is worked by horses. Respecting the implements used in a climate in which the sun has power to burn up weeds with only a scratching of the soil, and in a territory where harsh, obstinate, churlish clays are almost unknown, great mechanical powers of tillage are not so necessary as in our own country. The beams of the clumsy-looking wooden ploughs are attached to a sort of curricle, running from saddle to saddle, which is a miserable way of employing horse-power. A good deal of marling done here.

The slopes to the Loire are covered with vineyards; and its waters being thrown into strong currents here and there by the presence of islands, has hollowed out into caves, &c., the yellow cliffs that confine them. The best wines produced in the Orléanois are to be found near the St. Ay station on our route. Leaving Blois, with its historic castle, impregnable on one steep slope, and passing Amboise, whose plain was manured by the victims of that massacre which formed the prelude to the terrible tragedy of St. Bartholomew, the eye, wandering over a dead level, is attracted by what appears to be the towers of a vast cathedral, rising alone and solemnly. The imagination becomes active; and at last a city fills the space, which to our fancy had seemed the precincts of a solitary temple. It is Tours; and as we look about amongst its stately streets, we are reminded of what we have read of this cradle of the French monarchy.

Proceeding to Poictiers, it is noticeable that the lands are cultivated by oxen in pairs, without either driver or reins. The oxen are red-coloured, with a dash of black about the head. Poictiers is a picturesque town, abounding with antiquities, and in the autumn with pilgrims too, who had better be cultivating their fields, and making their homes happy, than spending their earnings in fattening an obese lazy priesthood, and kissing the marble sarcophagus of St. Radegonde. On we go, through vine-clad slopes and fertile country, yet well manured by many a gallant army massacred in the name of ambition or religion; run very near to the thriving Angoulême, perched upon hill top; cross the Dordogne, a large tidal river, at Liburne; intersect the tongue of land entitled "Entre Deux Mers," which is a fertile district chiefly laid out in vineyards and corn-fields, and scattered over with country seats; and finally glide into Bordeaux along the right bank of the Garonne, the wooded and vine-clad heights of Floirac forming a striking picture.

Here we are, then, at the seat of what we term in England the *claret* wines—a particular manufacture, called "*travail à l'Anglais*," and which consists of adding to each hogshead of Bordeaux wine three or four gallons of Alicant, and a small quantity of Hermitage. Bordeaux, the second seaport of France, containing 124,000 inhabitants, is well situated for carrying on a trade, principally in wine and hemp, with North and South America, the French colonies, and Great Britain. From 50,000 to 60,000 tons of wine are exported annually. Nearly half the best quality is sent to Great Britain; and very little is consumed in France. Amongst the "lions" of Bordeaux are the cellars of the banking wine-merchants, the MM. Barton and Guestier, in the Cours des Chartrons. They are two storeys in height, and commonly contain from 8,000 to 9,000 casks of wine. The duty paid by this house to the British Government in one year alone has amounted to £300,000.

The vineyards of the Bordelais extend between the 43rd and 45th degrees of latitude, and consist of 438,430 hectares, which produce an immense quantity of wine of all qualities. Be it remembered that the French people, in thus supplying their own beverages, are not using their best soils—their corn soils—as we do in England, but soils that, sometimes owing to position, and always to quality, will not produce anything else. Such soils as support the vine in France are quietly given over to furze and rabbits in England.

The *crus*, or growths, of the Bordelais may be divided into Medoc, Graves, Palus, and Vignes Blanches, which furnish wines of prime quality. To these may be added those of the territories known as Entre-deux-mers, Bourgeais, and Saint Emilion, the growths of which are of secondary order.

Medoc, in the department Gironde, which we find contains 140,000 hectares of vineyard, cultivated by 60,000 proprietors, and yielding an annual produce of 2,500,000 hectolitres, is a long tongue of land, nowhere more than two miles broad, extending northwards between the Garonne on the east and the Bay of Biscay on the west. It is, indeed, the northern termination of the extensive district of sand-hills and sand-plains extending from Bayonne, called "Les Landes." The character of the soil of this strip changes, as it approaches the Garonne, north of Bordeaux, from the sandy waste of the Landes to a light gravel, or what in some places appears to be a mere heap of quartz pebbles mixed with sand, which is nothing more nor less than the abrasions from the Pyrenean rocks, brought down by tributary torrents to the Garonne, and deposited, with that wonderful and merciful adaptation that bespeaks an Intelligence that designed the earth for the residence of man. There the vine flourishes; and when the bed of indurated conglomerate beneath is broken up by manual labour, so as to permit the roots to strike, no soil is so congenial to it, retaining as it does the sun's heat long after that luminary has disappeared. This bank rises 80 feet above the river; and proceeding by steamer up the Garonne to Pauillac, with a view to the Lafitte (the property of Sir Claude Scott) and Chateau Margaux vineyards, the eye in vain seeks the trained vine, but catches an intervening fringe of marsh meadow-land, grown over with willow-trees. Having landed, we find that the vine is trained, as it usually is here, in the fashion of espaliers, fastened to horizontal laths attached to upright posts 2 feet from the ground, running in an uninterrupted line from one end of the vineyard to the other. These rows are three feet apart, and from seeing the process of moving the soil in the intervals performed by oxen, drawing a plough, our own Tull several years ago got the idea of horse-hoeing, and brought it home, much to our advantage. To give his own account, he says he was struck with the field culture of the vine, and noticed that the low vineyards were planted in such a regular order that they could be constantly ploughed, and the soil thus pulverized between each vine at the proper season. He observed also that the vines had no other assistance in the way of manure than this hoeing; the reason of this being "because the heads and the roots were so near together that dung would spoil the taste of the wine they produce. It was from this practice I took my vineyard scheme, observing that indifferent land produces an annual crop of grapes and wood without dung; and though there is annually carried off from an acre of vineyard as much in substance as is carried off in the crop of an acre of corn produced on land of equal goodness, yet the vineyard soil is never impoverished unless the hoeing culture be denied it; but a few annual crops of wheat, without dung, in the common management, will impoverish and emaciate the soil. I cannot find, either in theory or practice, any other good reason for this difference, except that the vineyard soil is more pulverized by hoeing."

In the present state of the controversy on the Lois Weedon system of wheat growing, now carried on at home, it is well to unearth this scrap of evidence in its favour.

The same peculiar fickleness which was found in the vineyards of Champagne and Burgundy for the vines of St. Estephe and those of Lafitte, both on the same soil, produces wines to which very different values are attached in the market. The qualities of wine are, too, very dependent upon seasons. The goodness of a season will sometimes raise a secondary to a prime wine, or its unpropitiousness on the other hand may debase a premier quality to the rank of a third or fourth. When they are not reputable, so necessary is it to maintain the character of the various vineyards with the best customers, that exportation to England ceases, and Holland takes them, or they are retained in France. So well is this understood, that some years back "the proprietor of the vineyard La Rose used to hoist, on a flag staff above his house, the English flag in good years, the Dutch in middling years, and the French in bad years.

The vine begins to produce at five years of age, and will when the soil is deep and congenial, continue to flourish with unabated vigour two hundred years. Its roots have been known to descend in pursuit of nourishment to a depth of from forty to fifty feet. The best species of red grapes is the *verdot*. Those cultivated for white wines are *sauvignon, rezinot*, and *semillon*. They are propagated either by quicksets or by layers.

The value of land in this district rises from £60 to £200, the produce in some cases £15 per acre, and the average profit 7 to 10 per cent., which is decidedly more than under the present system of cultivation is yielded on the best lands of France by corn cultivation.

Those who scud through the country by railway can scarcely conceive of the misery amongst these populous vine districts, owing to the smallness of the property into which vineyards are usually divided. Arthur Young says of this circumstance—"The nature of the culture depending almost entirely upon manual labour, and demanding no other capital than the possession of the land and a pair of arms—no carts, no ploughs, no cattle—necessarily leads the poor people to this species of property; and the universal practice of dividing it between children, multiplies these little farms to such a degree, that a family depends on a spot of land for support that cannot possibly yield it. This weakens the application to other industry, rivets the children to a spot from which they ought to emigrate, and gives a flattering interest in a piece of land, that tempts them to remain, when better interests call them elsewhere." The consequence is, that they labour for their richer neighbours and neglect their own vineyards. Did they not possess a plant themselves, the poor could not be better situated than in a vine province where employment is abundant. In confirmation of this statement, with regard to the subdivision of land, Jullian, in his "Topographie de tous les Vignobles connus," shows that the vineyards of Guienne and Gascony consist of 438,430 hectares.*

The Graves are so-called from the nature of the gravelly soil which produces them, lying to the south-east and the south-west of Bordeaux. The Haut-Brion ranks first, the Haut-Talance and Merignac next. Descending the Garonne, opposite Langon, four leagues south of Bordeaux is Castres: upon this place we find a succession of vineyards, extending far down the banks of the river, those on the left being far superior to those on the right. This arises from the soil, a fine quartoize sand. The wines produced here are white. We enquire about a practice described by Arthur Young. He says that the vinters allow the chickweed to get ahead in their vineyards, which they pluck in May and dry, subsequently boiling it in water, and giving it mixed with bran, to their cows, who, upon this food are made to yield double the milk they will on any other. It is practised yet; and there is another method of feeding made use of in the neighbourhood. The vine leaves are gathered by women and children in September, and strewn along the roads to dry. No infusion is made of them in hot water: they are mixed with bran, and given in this form to the cattle, warm, in cold weather, with great benefit. Eight or ten acres of leaves will support a cow a whole winter.

This, the district of the Garonne, is perhaps the best cultivated in France. It lies like a garden, and is a great credit to the large, vigorous, and beautiful oxen that till it.

The green and fertile marshes which border the rivers Garonne and Dordogne, formed of successive alluvial deposits, produce the *Palus* wines, or the wines of the marshes. The vines shoot with a great luxuriance to a height of six feet, and are supported by poles, three of which are employed to each plant. The growths of this district are *très colorés*, full, and hard and rough when new. They are known as *vins de cargaison*, being adapted to sea-carriage, and are sent to the East Indies, or kept at home to give strength to the weaker Medoc wines. This tongue of land embraced by these two rivers is generally called Entre-deux-Mers, and, long before the Medoc was cultivated, was esteemed the best wine district in the country. The yellow cliffs along the river side are pierced, to form cellars, in which is deposited the wine grown above them. Some little distance higher up, we sight the handsome villa of the heirs of the Spanish Marquis d'Aguado, uninhabited on account of the malaria that prevails around it. It stands in the midst of vineyards producing the celebrated wine of Château Margaux. The grape that yields this wine is small and sour, with a taste resembling black currant.

In the department Dordogne, comprising 56,000 hectares of vineyards, apportioned amongst 79,323 proprietors, some fine wines, both red and white, are produced.

The department des Landes, comprising 19,230 hectares of vineyard, cultivated by 11,745 proprietors, is a singular, monotonous sandy tract of country, extending from Bordeaux S. to Bayonne. It is scarcely inhabited, and its principal production is seen in the dark bounthe eye; and the principal productions of its extensive tracts of heath are the lean ill-conditioned sheep to which theyare given over—of barley and maize cultivated in little parties, and those darkfir forests that bound the landscape. The shaggy Tripodic population that characterise this region cannot fail to surprise all beholders. On scanning them narrowly, we find them to be shepherds, who tend their flocks on stilts, carrying a pole to support them, and wearing a sheep's skin to protect them. They thus escape the prickles and sand below, command an extensive view, and possess great celerity of motion. The anomaly here presents itself of large flocks of ducks that have never seen a pond—for water is scarce; and this is one amongst those privations which cause the stunted people of the Landes to contrast unfavourably with the fine men and pretty women amongst the neighbouring Basquaize peasantry. Had we time, curiosity would prompt us, while seeking natural productions, to stretch on to Biaritz, to see those unnatural productions always on view, viz., French ladies and gentlemen, killing time in aquatic promenades, "en costume des bains"—the ladies looking like mermaids, floating about supported on corks or bladders, attired in woollen trousers, covering the feet, and overshadowed by broad-brimmed hats.

The vineyards of the Medoc are open, having neither walls, hedges, nor fences. A temporary fence is raised round the vines when the grapes begin to ripen, formed by boughs of trees interwoven with furze, to keep out dogs, which are most destructive consumers of grapes. Patrols with guns walk the vineyards day and night at this season; and curious signs are hoisted on poles, to indicate that the ground is strewn with poisoned meat, and the grapes smeared with poisonous matter. The vintage occurs in September, when the Medoc is all bustle and activity and rejoicing. The vignerons come in from all quarters, and the proprietors are all at home with their families. Busy crowds of men, women, and children sweep the vineyards from end to end, clearing all before them like bands of locusts, while the air resounds with their songs and laughter. For the better wines the fruit is picked with great care. For red wines all the rotten and unripe berries are rejected, but they are retained for the white. In the Medoc there are generally two pickings for the red wines, and at some places five or six. The grapes are freed from the stalks, and trodden, or, as at Lafitte, not trodden; in which case, curiously enough, they are found to produce a juice more highly coloured! Who would have thought it?

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* The hectare is equal to 2½ statute acres, and the hectolitre is equal to 22 gallons.

This not being the proper season, we refer for description of the subsequent process to an eye witness: "Every road," says he, "is thronged with carts filled with high-heaped tubs, which the labouring oxen are dragging slowly to the pressing trough. This is placed usually in a lofty outhouse resembling a barn, whence issue sounds of still louder merriment, and a scene presents itself sufficiently singular to the stranger. Upon a square wooden trough stand three or four men with bare legs, all stained with purple juice, dancing and treading down the grapes as fast as they are thrown in, to the tunes of a violin. The labour of constantly stamping down the fruit is desperately fatiguing, and without music would get on very slowly; a fiddler, therefore, forms part of every wine-grower's establishment; and as long as the instrument pours forth its merry strains, the treaders continue their dance in the gore of the grape, and the work proceeds diligently."

The wonder is that in such a hot climate the colour and the flavour are not both rendered *très prononcée* by such a process.

The vintage costs usually about £2 2s. per acre, including the fiddles.

The must flows from the crimsoned feet of the bacchanals, and is conveyed in buckets to the *foudres*, or large casks, containing from 8 to 12 tuns, where fermentation is carried on. When this point is arrived at, the skins which have been added to give colour are removed, and the wine is allowed to be drawn off in clean vessels, which are filled up, at first every two or three days, then once a month, and afterwards every three months at least. The white wines are racked in December, which, from containing more sediment than the red, require more care to escape being ropy. The red wines, racked in February or March, and being more apt to turn sour, are obliged to be kept in cool cellars during summer.

The red wines are in greater demand than the white, the strong rough growth being brought up to strengthen the weaker sorts. In favourable years the produce of Lafitte has been known to sell for 3,300 francs per tun of 42 gallons! which brings the best wine up to 6 francs per bottle. The first varieties are Lafitte, Latour, Château Margaux, and Haut Brion, the first being remarkable for its charming violet perfume. The colour grows darker as it advances in age, in consequence of the deposit of part of its tartar; but when well made, it seldom deposits any crust.

Of the white wines, those of Graves have mostly a dry flinty taste, with an aroma resembling cloves. The choicest are known as St. Bris and Carbonnieux.

The annual produce of the vineyards of Guienne and Gascoigne may be estimated at 6,020,000 of hectolitres, 2,000,000 of which are consumed at home. There yet remains a considerable tract of country, quite as well adapted to the growth of the vine as those tracts already so employed, and it is but reasonable to suppose that French capitalists, in view of the demand which will eventually be made upon them for claret wines, will commence the work of enclosing and planting. The progress in the cultivation of the vine, during the last 78 years, in extent as well as in produce, shows what the produce would be if strongly stimulated. In 1830, the extent of the vineyards in France was greater by 438,000 hectares than in 1788; and in 1849 the extent was greater by 200,000 than in 1830. M. Jullien states the average produce of a vineyard, per hectare, in France, was, in 1788, 13:92 hectolitres; in 1829, 16:70 hectolitres per hectare; and in 1860, it is 26:16 hectolitres per acre.

Putting out of the question the premier, nay, perhaps, the *deuxième classe* of Bordeaux wines, at what price may we expect to place them upon our tables? Wines, vastly superior to the *vins ordinaires* to be met with at the hotels on the Continent, whose alcoholic strength is from 11 to 13 per cent., and which would be likely to obtain a large popular consumption, will, when the duty is lowered to 1s. per gallon, which it will be next year upon wines of this strength, be obtainable at 6d. per bottle (6 bottles to a gallon).

At such a price many persons in the middle and humbler classes of society, now debarred the use of wine, will assuredly enjoy it as an article of daily consumption; and if by degrees the labourers and mechanics will use wines as restorers of exhausted strength, rather than gin and brandy, which excite and destroy both body and mind, the beverage that will produce so desirable a change deserves our most encouraging welcome.

F. R. S.

THE WAY TO MANAGE HORSES.—Never attempt to clean or otherwise disturb your horse while eating his meal, unless you want him to bite and kick. But when you clean, take him out of the stall, and make a business of it. Tie your horse in the centre of the stall, unless you want your horse to do as most horses do, drive more on one rein than on the other. Horses that are liable to cast themselves in their stalls, should be tied with a neck halter, giving them much more freedom of the head than the nose halter. Gentleness, firmness, and moderation will subdue the most obdurate.—*New England Farmer.*

THE IRISH BUTTER TRADE.

The importance of the Irish butter trade cannot be overrated. It is the sheet anchor of the farmer there—his all-in-all—the means of paying his rent and charges, defraying the cost of labour, and maintaining his family. In fact, the butter is his bank. Setting so high a value upon national manufacture, we were the more pained at some recent revelations in the great staple of the trade—the city of Cork. A very injurious practice, not only to the Cork market, but to the butter producers of Ireland, was detected, exposed, and, we trust, repressed before any real mischief had been done. The facilities for perpetrating the frauds, so opportunely discovered by the weigh-house committee, were so great, that it is a matter of congratulation they were not turned to more frequent account, and thus inflicted irreparable injury to the butter trade in the south. The rarity of the practice speaks well for the general integrity of the dealers, who know well that the frequency of such frauds would bring ruin on the trade, and divert to Holland, Belgium, and the Hanse towns that demand which Ireland now mainly supplies. Many persons believe that Ireland commands the British market—that she is without a rival in the production of butter—that the exports of all other countries are nothing compared with her own. This is a mistake. The import of foreign butter is very large, and has steadily increased under free trade. From 185,511 cwt. in 1844 it rose to 513,396 cwt. in 1856. Since then it declined to 441,606 cwt. in 1857, and further to 388,000 in 1858. Of the total foreign imports, Holland contributes the large quantity of 255,872 cwt. Now, it is computed that the total quantity of Irish butter shipped to Liverpool and London, which receive nearly all the Irish home export, is about 560,000 cwt., or little more than double the Dutch. We should not, then, have our Hibernian friends so sanguine about beating all rivals in the British market. The fact that the consumption of foreign butter has steadily increased, notwithstanding the 5s. duty, is a strong proof that rivalry is not only probable, but practicable; and to enable the Irish producer to hold his ground now, when all are placed on the same level—with the difference in freight only, which is slightly in favour of Ireland—they should be careful to supply the best possible article, and maintain the reputation for fair dealing which has hitherto characterized the Irish manufacturer and merchant. Dishonest practices will take place in every trade, and the very scrupulous Hollander has not been exempt from the charge of turning a *marc banco* by the exercise of a knavish ingenuity. It was with no little concern we saw some weeks past a circular from a London firm, complaining of the extensive adulteration in Irish butter. Messrs. Yeates, Acocks, and Copeman allege that butter is largely adulterated, and, as allegations are of little value without proofs, they give reasons for their belief. In the "season," as it is called, which extends from the middle of May to October, the average weekly arrivals in London of Irish butter were about 8,000 firkins. The average weekly arrivals this Winter, when the season was over, and the cattle are stall-fed and mostly dry, have been 12,000 firkins—showing an increase of 33 per cent. on the Summer's average. Instead of the production of butter declining in Winter, compared with Summer, it was imported at the rate of 4,000 additional firkins per week. The extra imports must have been the produce of adulteration, in the opinion of our informants, and they tell us how the thing is done. Large quantities of beef fat and suet are sent over from England to certain Irish ports, where the manufacture of the spurious article is carried on, with the aid of potato starch, water, and soda. Of this abominable compound about 8,000 firkins are sold every week in the London market. The retailer, who gets it much cheaper than the pure article —say from 10s. to 15s. per cwt.—forces its sale; and the consequence has been that this year the import of the REAL article has *declined* from 10,000 firkins weekly to less than 3,000. This is very alarming, and deserves the serious attention of all who feel an interest in Irish prosperity. The decline of the butter manufacture in England, from the expanding development of the cheese trade, as well as the increasing demand for fresh milk in the towns along the railway lines, afforded a great opportunity to the Irish butter producer, of which, in justice to him, we must say he took an honourable advantage, and not only held his ground, but opened new markets in the teeth of the Dutch competition. He does not fear, and has no reason to fear, a fair rivalry in the production of butter, pork, and beef; but if this systematic adulteration be not suppressed by some means or other, the butter trade will be seriously affected. It ought not to be difficult to discover the parties who lend themselves to this base fraud. The farmer is wholly relieved from blame. We suppose not one firkin in a hundred is "stripped" in the Cork market; for such impurity, as the circular states, is extensively carried on in some well-known ports. The farmer sometimes gave an extra soakage to the firkin, and extra salt to its contents, to add a few pounds to the weight, and depreciate the quality; but with knowledge came improved processes of treatment, and now complaints of dishonesty scarcely ever occur. Though, we believe, great difficulties exist against the practical working of an Anti-adulteration Act, especially in the case of articles which must undergo delicate chemical tests, yet butter needs no scientific apparatus to discover whether it be genuine or mixed with non-butyrine ingredients. At any rate, the process of detection is far simpler, and there can be little difficulty in tracing the nauseous article from the shop of the London retailer up to the Irish store whence it was shipped. Messrs. Yeates, Acocks, and Copeman distinctly state that beef fat and similar substances are notoriously sent over to Ireland for the express purpose of being mixed up with genuine butter, and then exported to London, and, we suppose, Liverpool, Bristol, and other ports. The places are not named where this disgraceful practice is carried on, but we doubt whether any southern ports resort to this manufacture. We fear much of this noxious stuff is prepared nearer home; and of this there can be no doubt, that a vast quantity of adulterated butter, purporting to be genuine, is sold to the working classes in Dublin. The dealers say that pure butter cannot be sold for the price they sell it at—1s. in the pound. The wholesale price of Cork seconds is at the rate of 14d. per pound, and when they retail at 1s. they must submit to a heavy loss, which they are not disposed to do, and supply the spurious article at the lower price. We believe legislation may be advantageously applied to the extirpation of this manufacture. If a person sells one-half hog's lard and one-half butter for whole butter, he is just as criminal and punishable as if he sold one-half sand for sugar, or chicory for coffee. Perhaps it would be inconsistent with the principles which govern relations of buyer and seller to enact that no person, subject to a heavy penalty, shall mix any ingredient with a genuine article, which will lower the price, if fraud be not intended. If a person buy a mixed article at a lower price, knowing it to be mixed, and where no dishonesty has been practised by the seller, we do not see how the law can interfere between buyer and seller, prohibiting the one from selling at a cheaper price what he states to be impure. But what the interposition of the law can accomplish is this—that no person shall sell as butter a vile compound of yellow fat, farina, and soda. The Irish members will take a deeper interest in Mr. Scholefield's bill after the very important facts communicated by the London firm, who have done excellent service in calling public attention to a matter which so vitally concerns Ireland. It should be remembered that very little Dutch butter is consumed by the English working classes. It is generally used by the higher, and for pies and all kinds of pastry is superior. The Irish is the favourite of the working classes, and in its pure state will always command the superiority, even at the enhanced price of 2d. or more in the pound. At present the impure stuff is sold as Irish firsts or seconds, and thus the character suffers, while the palate grows accustomed to the inferior article. The Irish members should "take counsel" on this vital matter. Three millions sterling a-year represent the value of Irish export trade in butter. It is worth looking after.—The Land.

THE OVER-PRESERVATION OF GAME.

It must be a very bad squire who does not do more good than harm by living in a country village. But there are very bad squires, and the owner of the Grange is one of them. He is, however, for the most part, an absentee, so, that we are little concerned with him, and, in fact, have only to notice this one of his bad habits, that he keeps that long belt of woodlands which runs into Englebourn parish and comes almost up to the village, full of hares and pheasants. He has only succeeded to the property some three or four years, and yet the head of game on the estate, and above all in the woods, has trebled or quadrupled. Pheasants by hundreds are reared under hens, from eggs bought in London, and run about the keepers' houses as tame as barn-door fowls all the Summer. When the first party comes down for the first *battue* early in October, it is often as much as the beaters can do to persuade these pampered fowls that they are wild game, whose duty it is to get up and fly away and be shot at. However, they soon learn more of the world—such of them at least as are not slain—and are unmistakeable wild birds in a few days. They then take to roosting further from their old haunts, more in the outskirts of the woods, and the time comes for others besides the squire's guests to take their education in hand, and teach pheasants at least that they are no native British birds. These are a wild set, living scattered about the wild country; turf-cutters, broom-makers, squatters, with indefinite occupations and nameless habits, a race hated of keepers and constables. These have increased and flourished of late years; and, notwithstanding the imprisonments and transportations which deprive them periodically of the most enterprising members of their community, one and all give thanks for the day when the owner of the Grange took to pheasant breeding. If the demoralization stopped with them little harm might come of it, as they would steal fowls in the home-steads if there were no pheasants in the woods—which latter are less dangerous to get, and worth more when gotten. But, unhappily, this method of earning a livelihood has strong attractions, and is catching; and the cases of farm labourers who get into trouble about game are more frequent season by season in the neighbouring parishes, and Englebourn is no better than the rest. And the men are not likely to be much discouraged from these practices, or taught better, by the farmers; for, if there is one thing more than another that drives that sturdy set of men, the Englebourn yeomen, into a frenzy, it is to talk of the game in the Grange covers. Not that they dislike sport! they like it too well, and moreover have been used to their fair share of it. For the late squire left the game entirely in their hands. "You know best how much game your land will carry without serious damage to the crops," he used to say. "I like to show my friends a fair day's sport when they are with me, and to have enough game to supply the house and make a few presents. Beyond that, it is no affair of mine. You can course whenever you like; and let me know when you want a day's shooting, and you shall have it." Under this system the yeomen became keen sportsmen; they and all their labourers took an interest in preserving, and the whole district would have risen on a poacher. The keeper's place became a sinecure, and the squire had as much game as he wanted, without expense, and was, moreover, the most popular man in the county. Even after the new man came, and all was changed, the mere revocation of their sporting liberties, and the increase of game, unpopular as these things were, would not alone have made the farmers so bitter, and have raised that sense of outraged justice in them. But with these changes came in a custom new in the country—the custom of selling the game. At first the report was not believed; but soon it became notorious that no head of game from the Grange estates was ever given away; that not only did the tenants never get a brace of birds or a hare, or the labourers a rabbit, but not one of the gentlemen who helped to kill the game ever found any of the bag in his dog-cart after the day's shooting. Nay, so shameless had the system become, and so highly was the art of turning the game to account cultivated at the Grange, that the keepers sold powder and shot to any of the guests who had emptied their own belts or flasks, at something over the market retail price. The light cart drove to the market town twice a week in the season, loaded heavily with game, but more heavily with the hatred and scorn of the farmers; and if deep and bitter curses could break patent axles or necks, the new squire and his game-cart would not long have vexed the country side. As it was, not a man but his own tenants would salute him in the market-place; and these repaid themselves for the unwilling courtesy by bitter reflection on a squire who was mean enough to pay his butcher's and poulterer's bill out of their pockets. Alas, that the manly instinct of sport, which is so strong in all of us Englishmen—which sends Oswell's single-handed against the mightiest beasts that walk the earth, and takes the poor Cockney journeyman out a ten miles' walk almost before daylight on the rare Summer holiday mornings, to angle with rude tackle in reservoir or canal—should be dragged through such mire as this in many an English shire in our day! If English landlords want to go on shooting game much longer, they must give up selling it. For if selling game becomes the rule, and not the exception (as it seems likely to do before long), good-bye to sport in England. Every man who loves his country more than his pleasures or his pocket—and, thank God, that includes the great majority of us yet, however much we may delight in gun and rod, let Mr. Bright and every demagogue in the land say what they please—will cry, "Down with it, and lend a hand to put it down for ever."—*Tom Brown, in Macmillan's Magazine for May.*

A NEW SYSTEM OF BREAD-MAKING.

The manufacture of the "daily bread" for the supply of nearly 3,000,000 people in the metropolis, is no trivial affair; and the how and the when and the where it is done, day by day or night by night, are questions of some importance to the general public. The millers, the master-bakers, and their journeymen are also parties interested, and the 2,600 bakers in London and its suburbs doing their ten, twenty, or thirty sacks a week, could tell a tale of production and consumption, of profit and loss, which would be very interesting in a social and statistical point of view to get at.

The bakers of London, like other traders, have their occasional troubles to contend with. At one time the death-in-the-pot cry of the Analytical Commission frightens the public out of its propriety, by the horrible amount of adulteration said to prevail; and the only wonder is how the bread-eating public, young and old, have managed to live and thrive so well for so long a period upon such vile ingredients. Bread, however, keeps up in consumption, and alum, chalk, and potatoes, or whatever else may be the additions to the flour, have no baneful effect, and the nine days' bugbear is soon lost sight of. Then comes the charge of short weight and high prices to be thrown in the bakers' teeth; to be followed by the strike, or complaints of his workmen. And now another thunderbolt is launched against the fraternity of the miller and his men. Dr. John Dauglish has sought to take the town by storm by publishing before the members of the Society of Arts the superior advantages of his "new system of bread-making;" which "he is sanguine enough to believe possesses many and great advantages over any hitherto practised." Even doctors, however, will disagree; for many very scientific men of the medical profession, fully competent to give an opinion, as well as practical men in the trade, were not disposed to concede all the advantages claimed for unfermented bread. Dr. Dauglish's system is announced to remove all the evils complained of, viz., "the spoiling of flour, the necessity for using alum, the long hours of labour, and the consequent unhealthiness of the trade of the baker."

Verily there is a Daniel come to judgment. If the subject broached had rested merely on the merits of the new system, by which unfermented dough is got ready in half-an-hour, instead of fermented, which requires many hours, and the chemical questions at issue had been the sole points discussed, we should have been content to let the matter stand by the issue raised. But, not content with this, the Doctor travelled out of the record into divers allegations as to the character of those engaged in the trade, the mode of conducting the business, and the unhealthiness of the occupation.

In all trades which supply great articles of consumption, whether butchers, bakers, grocers, publicans, or eating-house keepers, there is unfortunately so much rivalry and competition, that there is scarcely a decent living for any one to be obtained, while many who embark in it are very soon ruined; and some few there are who fail, and begin again, time after time, heedless of consequences. Dr. Dauglish told the public that "In the baking trade, as in most trades, there are different grades of respectability and credit; but there are two great divisions—the high-priced, and the low-priced, or 'cutting,' as they are called. In each of these two divisions there are, of course, many subdivisions. There are some—but these are comparatively very few—who are men of substance, possessing considerable capital of their own, and independent of any system of credit allowed by the millers. They are, consequently, in the most favourable position possible for the purchase of their flour, both cheap and good. But by far the greater number of bakers trade almost entirely with the capital of the millers, through a most vicious system of credit, which operates most prejudicially on their purchases of flour. It is this system of credit that has given rise to and perpetuates most of the commercial evils of which the baker has to complain; and which, whilst it exists, will ever oppose the most effectual obstacle in the way of permanent amendment. In England, where the trade of the baker is not interfered with by legal restriction, any man is at perfect liberty to commence it whenever he pleases; and as the article bread has not only become the essential want of every individual, but a daily one also, a single addition to the enormous number of bakers engaged in the production of small quantities increases the total of production so imperceptibly, that a new beginner has but comparatively little difficulty in finding, where every man is a consumer, an immediate market for his commodity among that large class of persons who are always ready to patronize the last new comer."

The facilities of credit afforded by the millers have, probably, chiefly arisen out of the excessively keen competition between millers themselves, which the introduction of steam for the purposes of grinding has given rise to, by destroying the virtual monopoly that the limited amount of available power previously existing created. With the flour supply, and the advantages or disadvantages of credit given by the millers to men whose daily returns are looked to as the only means of settlement, we do not propose to deal. Dr. Dauglish argued stoutly for the advantages of unfermented bread, and the use of the bran or cerealine principle attached to it. The latter, according to his showing, has proved to be a new nitrogenous body, analogous to gluten, with a portion of caseine. But how few are there, after all, who eat brown bread or biscuits from choice? Fine wheaten bread receives the preference, alike from rich and poor, in every country where it can be obtained at all, even when the price is high. Probably, like the great organ of the North—*Blackwood*—Dr. Dauglish would back the oatcake and the parritch against all the wheaten messes in the world. "We defy your home-made bread, your bakers' bread, your household bread, your leaven bread, and your brown Georges, your fancy bread and your raisin bread, your baps, rolls, scones, muffins, crumpets, and cookies, your bricks, biscuits, bakes, and rusks, your Bath-buns and your Sally Lunns, your tea-cakes, and saffron-cakes, and slim-cakes, and plant-cakes, and pan-cakes, and seed-cakes, and girdle-cakes, and singing pinnies, your short bread and your currant buns; and if there be any other names by which you designate your wheaten abominations, we defy and detest them all. We swear by the oat-cake and the parritch, the substantial bannock and the brose. Long may Scotland produce them, and Scotchmen live and fight upon them!"

We should like to set Dr. Dauglish down for some considerable time to the unleavened dishes of the tropics—the mess of rice, the plaintain foo-foo, African koskossoo, the supporne and Indian corn-pudding, Johnny cakes or cassava-bread. We doubt whether his heart would not yearn, after a while, for a little leaven to the lump. But there are powerful dissentients to the theory of unfermented bread. Liebig, in his recent letters on the chemistry of food, is unfavourable to it. Dr. Letheby stated to the meeting that the action of fermentation was to change the starch contained in the flour into a soluble substance, so as to make the bread more digestible, and to relieve the stomach of the labour it had to perform in digestion. He further added that the experience of those who, at certain seasons of the year, took unfermented bread, was that, although at first it digested easily and produced no discomfort, in the course of a few days it began to produce symptoms which were evidence of injury to the body—dyspepsia in various forms. The Jews knew very well that, when they used unfermented bread, various gastric derangements were produced. We require much larger experience in the use of unfermented bread before we can say that it can be used, as fermented bread is, for a long period of years, without injury to the body. Various opinions, pro and con., on the subject were advanced by Dr. Lankester, Dr. Waller Lewis, Dr. Odling, Dr. Aldis, and Dr. Grey; insomuch that, to use the words of Mr. Edwin Chadwick upon the chemical part of the question, there was great difference as to what was edible and what was not. The observations of one speaker were, however, discouraging. Dr. Gibbon had found that neither his friends nor his patients would take this bread, on account of its insipidity; and it is one-third dearer in price too. It was like distilled water—perfectly pure, but insipid. The incidental topics touched upon in the course of the debate led to much discussion; and Mr. Bonthron, a baker, and other speakers, spoke on the practical part of the subject as to the condition of the journeymen, the modes of manufacture, the use of alum, potatoes, &c.

It seemed to be generally admitted that alum was only used in the cheaper kind of bread made of inferior flour, when it acted as a corrective. That there is room for improvement in the class of bakehouses, the mode of manipulation, and the hours of labour in many localities, no one will deny; and therefore the general discussion and ventilation of the subject may do good, apart from the disputed point of the use of leavened or unleavened bread. It should be remembered, however, that the profits of the bakers generally are cut down to the very lowest ebb, and the delivery costs as much as a farthing per loaf; while the advance in the selling price to the public does not always follow immediately the rise in flour.

REMARKS ON SUMMER GRAZING.

There is no department of a farmer's business that requires so much of his attention and matured judgment as the management of his stock. The anxieties of the winter are now over, and the adaptation of his stock to their pastures now claims his chief care. This is a question of no ordinary course. The state and condition of his stock, and the nature, fertility, and fruitfulness of his pastures are alike equally requiring his notice. These must be in a state to suit each other. The condition of the stock to be depastured upon them must be in accordance with the "strength" and richness of the pasture. To "lay on" stock in poor or weak condition upon a rich pasture, or on strong land pasture, is certainly a very dangerous course, if not a destructive one. Good land must be stocked with good animals, or at least animals in a safe and healthy state. Poor or lean stock may possibly thrive on poor land, but seldom will they thrive on rich soils, or fast-growing fruitful pasturage, even should a favourable season produce such on a poor soil.

The art or science of grazing is no mean one, let the querulous and the despiser say what they may. The politician has the cares of government upon him; the banker, his issues, his notes, and his drafts; the merchant, his goods, his trade, and his credit; the manufacturer, his material, his orders, his patterns, his fabrics, and his workmen; the trader, his stock, his customers, and his bills. These and others, many and many, have their own peculiar cares and perplexities; but none are exceeded in number or in proportionate importance than those cares, anxieties, and perplexities daily experienced by farmers and stock-owners. Every animal is an object of individual and of especial daily care, every crop and every kind of crop is an especial object of intense interest, as upon the success attending the one or the other the farmer lives or droops.

The profitable grazing of his stock, then, is to him a matter of paramount importance, and great are his perplexities and doubts as to the best mode of carrying this department of his business out. Much will depend upon the character of the soil and pasturage with which he has to do. The occupiers of lands of the first-class—lands qualified to fatten readily the finest oxen—have a plain course to pursue. Theirs it will be to depasture with cattle of a high order; to put cattle in high condition, and requiring no great length of time, on good pastures, to prepare them for the butcher, and to bring them up to the first quality of meat. The next order of lands would be the prime sheep-pastures. These cannot be put to better purpose than in depasturing sheep of good age and condition, and the quantity of mutton and wool produced per acre goes well nigh to exceed in profit the somewhat superior bullock-lands. Be that as it may, each variety of land is best to be kept to its order of grazing—"bullocks" to bullock land, "sheep" to sheep lands.

The great difficulty that graziers have to contend with, is to make the most profit of the intermediate lands, and rotation seeds and clovers. Speaking generally, these had better be appropriated to breeding purposes, dairying, and the grazing of young stock. Most of the "sweet lands" in the Midland and other counties are well adapted for dairying uses, and nothing can pay better where conveniences accord. The produce of the dairy and the rearing of the young cattle are doubly remunerative; but there are exceptions: the majority of common grazing lands are not well adapted for dairying. These are best devoted to breeding purposes; or if some of the most fertile of these second-class lands are appropriated to fattening uses, it should be in conjunction with artificial aids. Cattle and sheep on such lands will fatten satisfactorily if liberally supplied with linseed cake—from four to six pounds for a bullock, and from half-a-pound to a pound for a sheep, depending much upon their size and weight respectively.

It is impossible to point out with any degree of accuracy a precise course of management for any particular description of soils or pasturage, so much depends upon contingencies, but it may be desirable to allude to some of the many courses pursued. Let us take first the grazing of such lands exclusively, and where breeding is not followed. We have presumed that these lands are not adapted for fattening purposes; we therefore devote them to the grazing or improving of young stock, or in whatever way we can render them most profitable by grazing.

Sheep.—The first course I would suggest is to purchase such a proportion of young sheep—hoggets—as could be conveniently fatted off upon the winter food crops—*i. e.*, mangolds, turnips, &c. These would have a good fleece of wool, grow in size and weight, and would make good mutton in the winter and spring months; and if desirable they might be kept and reshorn in the early spring. Again, ewe hoggets might be purchased in part; these to be sold in the autumn to the breeders—often a profitable business. These, if necessary, may be replaced by shearlings in the autumn to fatten on the winter food, or be kept on, to be sold in the spring to the summer graziers—in this state frequently realizing as much money as when fatted, and at less expense. Again, it is no uncommon thing to purchase ewes and lambs: the lambs to be reared, wintered, and sold to the summer graziers; and the ewes to be fatted on the winter food, or sold as fresh drapes in the autumn. In this way there is the loss of wool to be put as a counterbalance to the number of lambs reared and prepared for the winter's stock. Ewe wool is not of great value, and weighs lighter. The better plan appears to be a combination of these orders of grazing sheep. A mixed flock of sheep generally answers best; they each select their own particular herbage as food; they do better conjointly, and the grazier is thus better prepared to meet whatever class is most in demand at the close of the summer's grazing.

Cattle.—As breeding is not followed, the best course appears to be to purchase such young cattle as will be well qualified to fatten in the fold-yard during the winter. These would mix and graze well among the sheep if put on thin—say, one young steer to every five acres. Their age should be about two-and-a-half years to three years: such would come out remarkably fine beasts, if well done during the winter on cake and turnips or mangolds. A portion of the cattle grazing should consist of such like animals; but younger ones might be profitably grazed, and whose chief improvement is owing to increased growth. These would require greater watchfulness and care, as being less hardy, and probably frequent change of pasture would be requisite to keep them thriving. Young heifers are frequently in great demand in the autumn for breeding uses, and often pay well for grazing. Young drape cows will often thrive surprisingly well on scanty and somewhat inferior pasturage, and fatten very rapidly on winter food in the hovel or fold-yard. These animals are probably more sought after by summer graziers than any other. They fatten on pastures not truly adapted for such purpose; and what is better probably, they are in great request b country butchers. Another profitable mode of grazing these lands is by depasturing thereon in-calved heifers These are purchased in the autumn, or when convenient in the summer, put to the bull in the autumn, they are wintered inexpensively in the fold yard, and in summer are grazed amongst the sheep, and are sold off as they become ready for the cow-keeper. As remarked with respect to sheep, so the same will apply as to cattle—probably a combination of the several kinds and ages of cattle in grazing is best. The grazier has then always some that he can depend upon as being in demand and ready for the market. It is not always so, if he confines himself to any one description of stock in such case he is a speculator in a degree, and must wait his time for sale; but if he grazes a variety of stock the probabilities are that some one or other is in demand, and he can thus relieve his pastures.

THE PRACTICAL VALUE OF THE LOIS WEEDON SYSTEM.

There are many matters upon which people are proverbially superficial. Political Economy—the Freedom of the Press—the Balance of Party—the Rights of Nations—and so on, all come trippingly enough on the tongue, without the speaker often staying to consider much what he is really saying. Enough be it to show that he is "up" in the news of the day—generally, indeed, quite as well as his fellows. And so these mystic phases pass current for just so much or so little as the intelligence or industry of him who uses them is content to put them at. Of course everybody "knows all about" so familiar a topic, and straightway he passes on to something else. Now the Lois Weedon System has been to the world agricultural a good deal what Constitutional Principles, the Rights of Man, and so forth, have been to the world at large. That is to say, each one of us takes it for granted that he knows all about it, and therefore that he need not trouble himself to seek to know more. For the last few years there has been no household word more familiar amongst us than Lois Weedon, and yet no plan with which as a class we have had so little practical acquaintance. The agriculturist has been quite content with a passing remark, and then to leave it for some one else to take up, just as he might the weather, the income tax, or the health of your good lady.

Mr. Algernon Clarke, under the auspices of the Central Farmers' Club, has at length stepped in to the rescue. He seems to have felt how thoroughly unknown the Lois-Weedon system was, notwithstanding all that has been said and written of it. He has consequently, and, as we take it, very wisely, given a complete exposition of the course of proceeding. He has traced its origin, and detailed its practice. He has given minute directions how the experiment should be set about, and he has as carefully collated the results so far as they have yet been arrived at. He does this with something of the spirit of an advocate of Mr. Smith's argument, but with still stronger grounds for the position he has taken. He himself is practising what he preaches, and we saw last autumn, at Long Sutton, the alternate stripes that have now for some seasons been under his direction. He came, then, well armed; and he came, moreover, certainly not before he was wanted. Despite Mr. Smith's own pleasant little work, it is chiefly from his pupil's lecture that the world will gather what the Lois-Weedon system aims at, and what it has achieved. In a word, Mr. Clarke has ably done his duty by the Club and his subject; and we only regret that he was prevented by illness from himself being present to impress the points of his paper.

For, as it is, we stop here. A Deputation from the Farmers' Club has visited Lois Weedon and inspected the process in operation, while a meeting of the members of the Club has had the whole course of proceeding put before them as well perhaps as it was possible to have it elucidated. The effect, however, is not encouraging. We purposely forebore, a few weeks since, to hint at the impression made upon the practical men on their visit to the vicarage. It would have been altogether unfair to the discussion then coming on. But we may say now that no one regarded what he saw as much beyond a mere hobby—just the thing for a man with a few acres of land to occupy himself upon, and nothing more. The clergyman worked his field, and the village schoolmaster his garden; and the neighbouring farmers looked over the hedge as they rode by—amused, may be, but rarely convinced. As for the Club Deputation, they seemed to consider the whole secret of Mr. Smith's success to lie in the soil itself; one of the finest pieces of wheat-land they had almost ever seen. The meeting only took up the echo of this cry. There was scarcely a man in the room who had a word to say in its favour. Even Mr. Greene, of Mortival's, who has gone far more extensively into the business than anyone else, could not advocate the general adoption of the system. It is remarkable, indeed, that nowhere but at Lois Weedon can the plan be regarded as a decided success. Mr. Clarke's own trial, with his amount of yield on good land, can certainly not as yet to be taken as altogether conclusive. Mr. Greene finds the yield, again, not so good as he had expected; and Mr. Lawes, as the scientific authority, reports something like an utter failure. It is true, he did not quite follow out Mr. Smith's precepts; but we think we are warranted in saying that Mr. Lawes is so far "satisfied," that no other such an experiment will ever again be conducted at Rothamsted.

Then, at the meeting Mr. Charles Howard, who was one of the Club inspectors, was even "not at all surprised at the crop which Mr. Smith had grown upon that land. Indeed he should have expected that the produce would be still greater, and he rather wondered at Mr. Clarke's average too, because his land was very far beyond the average of the kingdom for wheat-growing purposes. Twenty-six bushels of wheat to the acre was nothing very extraordinary; and when he considered that, if they carried out the Lois-Weedon system, they must neglect the growth of roots and clovers, from which they produced their meat, he questioned whether they would be doing right in losing those crops, and going after another, which certainly, so far as the last few years were concerned, had by no means paid them so well." Mr. Wilson, who had also visited Lois Weedon, although some years since, "presumed that everybody had arrived at the same conclusion, that the system was utterly impracticable in this country." Mr. Fisher Hobbs said "there could be no advantage in it to the practical farmer;" and the Chairman thought "putting it into operation on a large scale would be a perfect absurdity." But, however decisive, the discussion itself was comparatively tame: more so than it should have been, and for this reason—nearly half the deputation that went to Lois Weedon, on the part of the Club, never appeared at the meeting. The absentees, moreover, were unfortunately those who might have given a little zest and interest to the debate. Mr. Owen Wallis, Mr. William Shaw, and Mr. Gray, of Courteen, all Northamptonshire men, might have said something as to the reception the system had met with in its own "native" county—what the farmers there thought of it—and, as we believe is the case, how wheat has been grown in some other parts of Northamptonshire for quite as long a period as it has been at Weedon, not only without manure, but also without the continual "fiddling about" the system seems so imperatively to demand. Of course, to be of any general use, the Members composing these visitation companies must hold themselves prepared to speak hereafter to what they have seen, or the very object of their inspection becomes comparatively nullified. The same thing happened after the Silsoe Allotment day, when scarcely a tithe of the party turned up at the Club Meeting. It is only to be hoped that at the gathering in June, when the subject of Steam Cultivation comes on again, we shall hear more of what the visitors saw and thought of "the other Mr. Smith."

However, to fill up the idle hours of a "generally useful" gardener or groom, or to teach the young idea of the agricultural class of a National School, the Lois Weedon System may answer well enough. But, with labour in the demand it is, and must continue; with wheat at present prices; and mutton and beef not to be altogether ignored, we question very much whether the farmer, like the charity-boy when he got to the end of the alphabet, will think it worth while "going through so much to learn so little."

PRINCIPLES OF MANURING.

Lawes' and Liebig's Controversy on the Principles of Manuring popularly explained.—The Rothamsted Experiments with Special Manures described.—Instances given of consecutive Corn Growing both without and with Manure.

Of all the new faiths entertained of late years by the modern husbandman, none is more lively than that which attributes to nitrogenous manuring a specific virtue of fertility. To this belief, two circumstances have conspired: First, the continuous flow of argument in favour of the expedient, which for many years has issued from Rothamsted; and secondly, and chiefly, the seeming success with which the actual use of dressings rich in nitrogen has in very many instances been attended.

Yet, in the midst of this general confidence, a warning voice has been proclaiming the practice to be alike spoliative and ruinous—spoliative, in as far as the tenant thereby procures a fore-stalled profit from the soil; ruinous, in as far as the land will revert to the owner in a beggared condition.

"The farmer, who cultivates land which is not permanently his property, has the greatest interest in obtaining from the land, during his occupancy, the highest possible produce. The condition in which he leaves the land to his successor is no object of his care. For this farmer, ammoniacal salts and manures very rich in nitrogen, which he supplies from without, are the best and most profitable manures. On the other hand, the proprietor of the land has the greatest interest that his land should continue in the same state of fertility in which he has handed it over to the farmer. *The use of manure rich in nitrogen by the farmer prepares for the proprietor the ruin of his land.* The greater the quantity of active mineral constituents extracted from the soil in the crops by the use of such manures, and the less the quantity of these mineral constituents restored to the soil in these manures, *the more rapidly does the capital of the proprietor diminish in value by this system of exhaustion.*"—Liebig's paper on "Agricultural Chemistry;" *Royal Agricultural Journal*, volume xvii. "A field which, by manuring with these last-mentioned salts" (*i. e.*, salts rich in nitrogen) "has produced a larger crop for one or more years *is thereby impaired in fertility* for future crops."—Liebig's letters on "Modern Agriculture," p. 81. "The *apparently* remunerative employment of these means on many fields may last for a long time, ere the agriculturist becomes aware of the injury he is doing himself, by neglecting to return the mineral substances removed by his crops; but the longer he continues by them to obtain these large crops, he is approaching nearer and nearer the limits at which they must cease."—*Ibid*, p. 84.

Now, obviously, in these emphatical predictions is implied this proposition—That whatsoever flush of fertility may at first attend the use of highly nitrogenized manurials, the inevitable consequence sooner or later will be, a corresponding prostration of the productive power of the soil in which they are used.

Here, then, the question may be brought to a narrow issue, namely this: Are there, or are there not, any manifestations in the Rothamsted experiments, of a decreasing rate of yield consequent on the use of nitrogenous manures? If yea, then must the experiments be deemed to be confirmatory of Liebig's teaching. If nay, then must the Rothamsted nitrogenous theory be held to be corroborated as far as a set of trials confined to one given soil and climate can yield conclusive evidence on so very large a question.

Now, the manner by which this important point may be satisfactorily settled seems naturally to be, to divide into equal parts the period of years involved in the experiments, and then to examine whether the mean produce of the second division is greater or less than that of the first. If unequivocally less, Liebig is right, and his antagonists wrong; if greater, then may the result be deemed as militating against his dicta.

Arrived at this point, we now at once refer to a diagram forming part of the experimentalists' paper of 1856, vol. xvi. of the *Royal Agricultural Journal*, in which is tabulated each of the yearly products of wheat (both corn and straw) of that one of the trial plots designated Plot 10 A. In point of time, this instance comprised eleven consecutive years, ending with crop 1855; and throughout this long period the soil received no dressing save nitrogenous salts (sulphate and muriate of ammonia), but in different quantities in different years.

TABLE I.

	Corn & Straw. lbs.
During the entire period of eleven years, the total produce was..........	49,875
But divided into the quantities produced in the first and second halves of the period, these stand thus:	
First period	26,031
Second period..............	23,844
Decrease in the second period..	2,187

Again, in a prior report of these experiments, given in vol. xii. of the same Journal, data are given for showing what the corn produce was, exclusive of straw, for six years ending 1850:

TABLE II.

	Dressed Corn. lbs.
It amounted altogether to.............	10,728
In the first three years the produce was..	5,532
In the second three years	5,196
Decrease....................	336

TABLE III.

From another plot (10 B) which, in eight years ending 1855, was ammoniacally manured—

	Corn and Straw. lbs.
The total produce of corn and straw was..	40,743
In the first four years the produce was ..	20,927
In the second four years................	19,816
Decrease....................	1,111

But further, it has already been stated that during the various years of each experimental series various quantities of manure were administered. Of these quantities the particulars are given for a number of years sufficient to found any conclusions, as respects only plot 10 A, already adverted to, the period being the same six years ending 1850 spoken of before.

TABLE IV.

	Manure. lbs.	Dressed Corn, lbs.
Quantity of manure employed in the first three years	860	
Produce of corn, exclusive of straw, in the same period..............	..	5,532
Quantity of manure employed in the second three years	1,100	
Produce of corn, exclusive of straw .	..	5,196
Increase of manure in second period	241	
Decrease of produce in dressed corn		336

From this it appears that the decrease in the second period occurred notwithstanding an increased use of manure.

Thus far the tendency of these results is to support Liebig's assertion, that special manures of the nitrogenous kind sooner or later produce an exhausted condition of the soil; and from the experiments in *Wheat growing*, we now turn to the reported evidence of a contemporaneous series of trials with *Barley*.

Here the same procedure was followed as in the wheat trials—that is to say, these experimental plots were similarly tilled, but variously manured; and the following condensed table is so constructed as to exhibit the productive results in dressed corn:

TABLE V.—RESULTS OF EXPERIMENTS IN THE GROWTH OF BARLEY BY DIFFERENT MANURES, MADE DURING SIX CONSECUTIVE YEARS, ON THE SAME LAND—1852, '53, '54, '55, '56, '57.

Experiments.	Manures—Quantity per Acre per Annum.	Dressed Corn, in Bushels and Pecks. Average Yearly Produce per Acre in Six Years.		Average Yearly Produce per Acre in First 3 Years.		Average Yearly Produce per Acre in Second 3 Years.		Average Yearly Increase per Acre in Second 3 Years.		Average Yearly Decrease per Acre in Second 3 Years	
		Bushs.	Pecks.	Bushs.	Pecks.	Bushs.	Pecks.	Bushs.	Pecks.	Bushs.	Pecks.
	Series 1.—Gauge or Standard Series.										
1	No manure	27	3	29	3	25	3	—		4	0
2	20 bushels clay and wood ashes	28	0¾	28	2	27	3	—		0	3
	Mean of six years	28	0								
3	14 tons of farm-yard manure	43	0¾	41	3	44	2	2	3	—	
	Series 2.—With direct Mineral Manures.										
4	Mixed alkalies, viz., 300lbs. sulphate of potash, 200lbs. sulphate of soda, 100lbs. sulphate of magnesia	28	3¾	30	0	27	3	—		2	1
5	Superphosphate of lime, viz., 200lbs. calcined bone dust, 150lbs. sulph. acid	31	2¾	34	0	29	0	—		5	0
6	Superphosphate of lime and mixed alkalies, as in Nos. 4 and 5	34	2	36	3	32	1	—		4	2
	Mean of six years	31	2¾								
	Series 3.—With Nitrogen per Acre equal to about 50lbs. of Ammonia, both without and with direct Mineral Manures.										
7	275lbs. nitrate of soda alone (for only five years)	42	0¼	43	2	40	2	—		3	0
8	100lbs. each sulphate and muriate of ammonia alone	38	2½	41	0	36	0	—		5	0
9	100lbs. each sulphate and muriate of ammonia and mixed alkalies, as in No. 4	39	2¾	40	3	38	2	—		2	1
10	100lbs. each sulphate and muriate of ammonia and superphosphate of lime, as in No. 5	45	2½	46	2	44	2	—		2	0
11	100lbs. each sulphate and muriate of ammonia and superphosphate of lime as in No. 5, and mixed alkalies as in No. 4	46	1	46	2	45	3	—		0	3
	Mean of six years	42	2								
	Series 4.—With Nitrogen per Acre equal to about 100lbs. of Ammonia, both without and with direct Mineral Manures.										
12	500lbs. nitrate of soda alone (for five years only)	47	3¾	46	0	49	3	3	3	—	
13	200lbs. each sulphate and muriate of ammonia, alone	46	0	47	1	44	3	—		2	2
14	2,000lbs. rapecake alone	48	0¾	46	2	49	3	3	1	—	
15	200lbs. each sulphate and muriate of ammonia and mixed alkalies, as No. 4	42	3½	44	3	40	3	—		4	0
16	200lbs. each sulphate and muriate of ammonia and superphosphate of lime, as in No. 5	49	2¼	49	3	49	2	—		0	1
17	200lbs. each sulphate and muriate of ammonia and superphosphate of lime, as in No. 5, and mixed alkalies, as in No. 4	50	3	50	3	50	3	—		—	
18	2,000lbs. rapecake and mixed alkalies, as in No. 4..	44	2	41	3	47	1	5	2	—	
19	2,000lbs. rapecake and superphosphate of lime	47	2¾	44	2	50	3	6	1	—	
20	2,000lbs. rapecake and superphosphate of lime, as in No. 5, and mixed alkalies, as in No. 4	48	0	46	0	49	3	3	3	—	
	Mean of six years	47	0½								

ABSTRACT OF THE MEANS OF EACH SERIES FOR SIX YEARS.

Series.	Manures.	Means.		Increase over Gauge Mean.	
		Bushs.	Pecks.	Bushs.	Pecks.
1	Mean of the gauge or standard *unmanured* series for six years	28	0	—	
2	Mean of the series manured with direct mineral manures only..	31	2¾	3	2¾
3	Mean of the series containing nitrogen equal to about 50lbs. of ammonia..	42	2	14	2
4	Mean of the series containing nitrogen equal to about 100lbs. of ammonia	47	0½	19	0½

In examining this tabulation it will be well at first to confine attention to Series 1, and which is seen to consist of three experiments, as follows :—

	B.	P.
No. 1. Unmanured .... No. 2. Manured with 20 bushs. of clay and wood ashes, and of these the produce is united and thrown into one mean of..........	28	0
No. 3. Manured with 14 tons of farm-yard manure	43	0¾

And the object for which these trials were instituted, and the results classed together, is expressed by the experimenters in the following words, "The mean result of the *unmanured* and *ash* portions, taken together, form one, and that of the *farm-yard manure* another *standard of comparison* by which *to judge of the effects of the other manures*."—P. 481.

Let us, then, next inquire a little into the competency of these tests to perform the important duty thus assigned to them.

	B.	P.
EXP. 1. Annual acreable produce for 6 years	27	3
Ditto ditto for first period of 3 years	29	3
Ditto ditto for second ditto	25	3
Annual acreable *decrease* at the end of 6 years	4	0

EXP. 2. Annual acreable produce for 6 years......	28	0¾
Ditto ditto for first 3 years	28	2
Ditto ditto for second ditto	27	3
Annual acreable *decrease* at the end of 6 years	0	3

EXP. 3. Annual acreable produce for 6 years	43	0¾
Ditto ditto for first 3 years	41	3
Ditto ditto for second ditto........	44	2
Annual acreable *increase* at the end of 6 years	2	3

Now, although it is essential to the validity of any assumed standard of comparison that it should in its elements be congruous, and in its secular character determinate, here are presented a series of standards, exhibiting in one instance a rapidly falling succession of annual results, in another a succession of results nearly constant, and in a third a succession of yearly products showing a lively ascending progress of fertility; whilst also it is no less true that at the time these and the other experiments were terminated, neither the descending nor ascending progression had reached a minimum or maximum limit. Nor is this all, for of this gauge series it is also true that, not presenting the mean produce of Experiment 1 as a gauge by itself, or of No. 2 by itself, the two are fused together thus—

	B.	P.
EXP. 1. Average acreable produce for six years....	27	3
EXP. 2. " " "	28	0¾
Mean......................	28	0

And this compound sum of 28 bush. is actually given as a gauge mean by which the other experiments are to be tested, although, as has been shown, one element of it belongs to an *unmanured* trial, falling secularly at the rate of 4 bush. per acre per annum in six years, and the other to an experiment in which the benefit of clay and ashes as a fertilizing compost exhibits itself in a manner so unfluctuating as to produce an all but entirely sustained produce of upwards of 28 bush.

Leaving now the gauge series, the next observation to be made is that, as respects the other three series, the same incongruity of classification, and fallacious construction of averages, manifestly prevails. To follow the several steps of the demonstration by which we shall now verify this assertion, the reader will do well to confine his attention, at first, to the Abstract at the end of Table V., where is shown that between the mean of the *unmanured* gauge series No. 1, and the mean of the *mineral* series No. 2 there is a difference

	B.	P.
of yearly acreable produce, in favour of the minerals, of............................	3	2¾
In the 3rd, or *minor nitrogenous* series, the success is ostensibly much greater—namely ..	14	2
And in the 4th, or *major nitrogenous* series, greater still, being no less than,.............	19	0½

And hence, looked at superficially, one might be very ready to assign to the manures in each series a productive value proportionate to these several increased amounts; and this, in fact, is the conclusion inculcated by the experimenters themselves, by the following process of reasoning:

If the chemical composition of the manures in series 2 and 3 be compared together, it will be seen that each contains equal quantities of mineral matter, but in the 3rd only will any nitrogen be found; and hence it is inferred that the superiority of No. 3 above No. 2 is due to the available nitrogen so placed within the soil.

	B.	P.
In No. 2, the increased yield was only	3	2¾
In No. 3, the increased yield was	14	2
Superiority ostensibly due to the available nitrogen of No. 3	10	0¼

But, alas! when the experimental results of either of these two series are examined in detail, it is seen that, except as respects one instance, in all of them, nitrogenous as well as purely mineral, the produce obtained had *undergone*, and was at the inchoate termination of the experiments actually *undergoing*, a decreasing influence, exhibiting itself in every grade of diminished yield, from 2 bush. per annum per acre (as seen in Exp. No. 10) to 5 bush. per acre, as seen in the nitrogenous experiment No. 8, and the mineral trial No. 5. Tested by the fallacious gauge afforded by Exp. 1, these two series do indeed present a plausible aspect of enhanced fertility; but since it is true that both the gauge and the two sets of associated instances to which it is applied are equally guilty of running out the land, as evinced by the secularly decreasing yield, what choice is there but to scout all the three, as spoliators of the soil in greater or less degree?

The last member of the series—namely, No. 4—may now be examined; and here anomalies yet more extraordinary present themselves.

According to the abstract subjoined to Table V., the increased average produce of the nine experiments embraced in this section, above that of the so-called gauge mean, is 19 bush. 0½ peck. And these nine trials are composed of—

1	with nitrate of soda.
4	with rapecake alone, and with alkalies and phosphate of lime.
4	with sulphate and muriate of ammonia, alone and with alkalies and superphosphate.
9	

Now, of the foregoing mean of 19 bush. 0½ peck of alleged annual increase, it has to be remarked that it comprises—

	B.	P.	B.	P.
1st, An *increasing* produce, as respects the nitrate of soda, of			3	3
2nd, An *increasing* prodnce, as respects the rapecake, &c., varying from	3	1 to	6	1
3rd, A *decreasing* produce, as respects the four ammoniacal instances contained in it, ranging from.	0	0 to	4	0

Thus, then, this concluding series No. 4 embraces three indeterminate means—two rising, and one falling; and therefore, when the experimenters present us with the figures 47 bush. 0½ peck, as the total productive mean of Series 4 (see Table V.), and with 19 bush. 0½ peck (see the Abstract), as the mean of increased produce compared with the other series, they are in reality no means at all, but mere arbitrary sums, composed of an agglomeration of incongruous details belonging to an intermixture of instances, some indeterminately ascending in their results, and others characterized by a secular descent no less indeterminate.

Throwing aside, then, this fallacious method of comparison, and repudiating a tabulation which, like that we have been examining, classifies together and then averages the most discordant elements, our next endeavours will be to select from amongst the twenty trials a single case, possessing the qualities of a true gauge or standard. This done, we will, in conclusion, point out that when the instances in which nitrogenous salts were used are thrown into natural groups, in these not only did a large amount of secular decrease prevail, but, approximately, the ratio of decrement was in proportion to the relative amount of nitrogen in its manure. But this we shall reserve for another paper.

TILLAGE; OR DEEP CULTIVATION, AND ITS RESULTS.

The ordinary monthly meeting of the agricultural section of the Dublin Chemical Society was held in the society's rooms, on Tuesday the 1st of May last.

Mr. Bowles, Cloughranhuddart, having been unanimously called to the chair, the following paper on the above subject was read by Mr. Pringle:—

Since the introduction of artificial manures, there has naturally been great interest felt in that subject, and it has, consequently, assumed a very prominent place in discussions on agricultural matters, and in the columns of agricultural journals. It is but reasonable that such should be the case. Prior to the introduction of ground bones—which was the first form of artificial manure with which the farmers of this kingdom became acquainted—the supply of fertilizing material was limited to the home resources of the farm; and farm-yard dung, either in its natural state or eked out in composts, was the only means at command, in the majority of cases, for maintaining or increasing the fertility of the soil, in so far as manures were concerned.

The supply of this material was necessarily limited, and the operations of the farmer were confined within narrower bounds than those which they now occupy. When the fetters which tied, in a great measure, the hands of British agriculturists were broken, by the introduction, first, of bones, then of guano, next of sulphated or dissolved bones, and of the various forms of manure of which the latter, or substances possessing, in certain respects, similar properties, as well as other materials which now swell the list of fertilizers, it is easily understood how such a subject as that of artificial manures should possess features of even more than ordinary interest. Those manures have supplied the means not only of fertilizing lands already in cultivation, but also of adding to the area of cultivation; and in many parts of the kingdom thousands of acres have been reclaimed which could not have been done without the assistance of artificial manures.

Whilst it is right, therefore, that we should fully appreciate those valuable auxiliaries, it is equally necessary that other points in agricultural practice should not be overlooked. It has certainly occurred to me that we are, unwittingly no doubt, accustoming ourselves to look upon the aid afforded by manures as being of such a nature as to enable us to disregard, comparatively speaking, other essentials. Now, we cannot do this, or attempt to substitute one part of the system for another, without loss. We cannot regard manure as a sufficient substitute for effective culture; nor can we, on the other hand, regard tillage as a substitute for manure. Each has a separate action, which is more or less effective, according to circumstances; but it is only when united when the full amount of benefit is realised. A steam-engine is a beautiful and highly useful piece of mechanism; so is a thrashing machine. Keep them asunder, and they are of comparatively little value, although each possesses its own peculiar qualities; but unite them and then we have those qualities brought into a state of effective, because combined, operation. It is the same with tillage and manures, when they are brought to bear on the production of plants. Tillage performs its part, and for a time may even seem to have an effect which apparently renders the application of manures less necessary; and manures, again, act upon soils so as to compensate in some degree, for an imperfect system of cultivation. Still, if one is neglected for the other, the action of that which is adopted becomes sooner ineffective than it would do were both united.

It has long been an established principle, that deep culture is an essential to good husbandry; but although this is theoretically acknowledged to be true, we will find in numerous instances that it is not practically recognised. The actual cultivated body of soil in such cases is limited to a depth of four or five inches at most, underneath which is a sole or crust through which the roots of plants cannot penetrate. Nor do we find this to be the case where some physical impediments exist sufficient to obstruct all attempts to penetrate the subsoil, but in cases also where that portion of soil which lies underneath the cultivated part is of considerable depth, and of such a nature as to fit it in an especial manner for being opened up, and rendered available for the production of plants

I am very well aware that a prejudice has in many cases arisen against deep cultivation, from the fact that its adoption under certain circumstances has proved detrimental rather than beneficial. I remember having seen a field which had been deeply trenched several years previous to its coming under my notice, and which afforded a strong proof of the erroneous application of a correct principle under unsuitable circumstances. The field was represented to me as having been moderately fertile previous to its being made the subject of an experiment in deep cultivation; but when I saw it, its condition was wretched. Very important preliminary operations, however, had been neglected. The field lay on a cold, wet clay subsoil, and it had been trenched without being first thorough-drained. That was the secret of the failure; but a powerful and very unfavourable impression against deep cultivation had been left on the minds of the occupying tenant, and of others around him.

Efficient draining must precede deep working of the soil, and I would be sorry were any remarks of mine, much as I value deep culture, to foster the idea that the latter operation could be substituted for the former with any hope of success. There are soils, no doubt, which do not require drainage, and which will be greatly improved by the adoption of deep cultivation; but those are exceptional cases, and of too rare occurrence to affect general principles.

The contradictory views which are practically held by some regarding the utility of deep cultivation in farm practice appear to be somewhat strange. Thus, it is allowed by many that trenching is a very suitable and proper practice for a gardener to pursue; but they cannot see the propriety of extending the practice to the working of a farm. They find no difficulty whatever in allowing that deep cultivation is all very right and proper if we are to grow cabbages or potatoes within the walls of a garden; but they shake their heads with the most profound gravity when the extension of the principle to the fields beyond the garden is mooted. With them "sauce for the goose" is not always "sauce for the gander." This is unreasonable, however; for both parties—agriculturists as well as horticulturists—are engaged in carrying out precisely the same object, to wit, the production of plants, and very often of precisely the same plants. Whatever system of cultivation, therefore, is found best suited for promoting the growth of plants in one case cannot surely be unsuited for effecting the same object in another.

There are others, however, who will admit the correctness of the principle of deep culture, but who object to its extension to farm practice on the score of expense. They say, we may afford to trench our gardens, but we cannot afford to adopt a similar course of operation in our fields. This is bringing the question to a practical point; and although it is obviously impossible, within the limits to which such a paper as this must necessarily be confined, to enter into any lengthened statement of comparative expense and results, the importance of this point is such that it cannot be overlooked; and before I conclude I will, therefore, draw your attention to certain details as exhibited in some particular cases.

It is necessary, however, that we proceed step by step; and I would, therefore, allude, *first*, to the different modes by which deep cultivation may be effected; and *next*, to some of the effects produced by deep culture.

Deep cultivation is a comparative term, and what is so in one case may be the reverse in another. The common plough in ordinary ploughing does not in most cases turn a furrow exceeding seven inches in depth, and in many cases not above four or five inches. Whatever may have been the depth which has hitherto been the rule in any particular instance, if we go deeper—even an inch or two—it is, to a certain extent, an example of deep culture, and as such will be found productive of certain results. But this is still only comparative, and of a shallow and superficial kind, compared with a moving and mixing of the soil to the depth of twelve, fifteen, eighteen, twenty, and even twenty-four inches. It is frequently astonishing, however, where circumstances are otherwise favourable, to those who are ignorant of the stores of plant-food which a little deeper ploughing renders available, in cases where the surface soil had for many years been only lightly tilled, to witness the results of breaking into and bringing up that really virgin soil which is found in such cases under the thin layers of exhausted surface soil. In fact, it appears almost like magic, and not a little difficulty will sometimes be experienced in convincing such people as to what is the real cause of the increased fertility which so much surprises them.

Down to a very recent period the use of the spade or fork was considered the most efficient mode of deepening and mixing the soil, whenever it was thought proper to go beyond that depth which could be effected by the plough. During the famine years, and prior to that period, this mode of deepening the soil was strongly insisted upon as affording remunerative employment for labourers in our rural districts. Since that period, however, it has rather fallen into disuse, chiefly in consequence, perhaps, of the scarcity of labourers, as well as other reasons to which it is not at present necessary to allude. At the time referred, to I had considerable experience in this mode of improvement, and am perfectly satisfied as to its beneficial operation, when properly carried out. We may stil, however, find cases where it is practised, and in such the steel fork has generally superseded the spade, the former being lighter, and altogether better adapted for the purpose. Without entering into particulars—which my limits will not permit—I may be permitted, merely by way of illustration, to say that Mr. Brady has, I believe, gradually increased the depth of soil at Merino from seven inches to at least eighteen or twenty inches, chiefly by the use of the spade and fork. Mr. Niven also uses the fork rather extensively in deep cultivtaion, trenching the land two feet deep by means of it, at a cost per Irish acre, by day's wages, of £7 13s.; and although the expense appears to be large, yet he finds it repaid in the first crop. A report of Mr. Nivin's system was given in the *Farmers' Gazette*, Aug. 27, 1859, to which I must refer for details.

The introduction, by the late Mr. Smith, of Deanston, of the subsoil plough, as a follower of the thorough drain, was an event of much importance, not only from the effects produced by the use of this implement when employed in breaking up the indurated subsoil, but also from the enlarged and more correct views which it was the means of imparting to many on the subject of deep culture. Its application by some as a substitute for, instead of a follower of, the thorough drain, militated against it in certain cases; but it is most unquestionably a valuable implement when properly applied. Still, with all my predilections for the Deanston subsoil plough, arising from a rather extensive experience of its use, I do not consider it a perfect implement. It rips up the under soil, and gives additional depth; but it does not effect this in such a perfectly uniform and complete manner as all the requirements of deep culture demand. Some, indeed, allege that the effects of subsoiling are not lasting; but I am not of that opinion. I have, no doubt, met with cases where the results apparently favoured such views; but in tracing the history of those cases—which were always in connection with stiff, cold clays—it was evident that the subsoil plough had followed the drain too closely, and without giving the latter proper time to act. Where the latter point was attended to, however, I have seen, even on very obdurate clays, that the effects of subsoiling by the Deanston plough were perfectly visible at least fifteen or twenty years after the work had been done.

Various forms of subsoilers have been introduced, and many of these possess great merit. The most perfect implement, however, or rather combination of implements, for effecting deep and uniform culture, is to be found in the Tweeddale plough and the Tweeddale subsoil-trench-plough. These were invented by the Marquis of Tweeddale, and first used by him in the improvement of his farms on the Yester estate. The Tweeddale plough, at first sight, appears to be a heavy and cumbersome implement; but although it turns a furrow 15 to 16 inches deep, and 14 inches wide, it is held by the ploughman with as much ease as any common swing plough turning a furrow of 6 or 7 inches in depth. This arises from the structure of the mould-board, which, to use Mr. Stephens's description, "instead of pressing against the furrow-slice along its entire length, gets quit of it at once by its convex breast, and causes it to slip along in a straight line till it reaches near its ear, when the furrow-slice assumes its proper position by its own gravity. Friction of the furrow-slice is thus practically avoided." In another place he says "The furrow-slice, in place of being turned over in an entire form, as by our fine working ploughs, is only so far turned, and at the same time broken, as serves to present the soil in the best possible state to the ameliorating effects of atmospheric influences. In this respect the Tweeddale plough stands unequalled; and since the extinction of the old Scottish wooden plough, no implement has approached the point to which this has attained, for enlarging the extent of surface exposed to the atmosphere."

The Tweeddale plough is used in giving the winter furrow and spring cross-ploughings for green crops, and also in ploughing the seed furrow for grain. Indeed, I believe that after ploughmen get used to it they prefer it to any other form of swing plough, from the ease with which it is held. But although it certainly in itself does effect much deeper tillage than any other form of plough, when it is conjoined with the Tweeddale subsoil-trench-plough, a still greater depth of soil is not only broken up, but thoroughly pulverised and intermixed. The subsoil trench-plough is of peculiar construction, having an inclined tail-board affixed to the sock, by means of which the loosened subsoil is carried in an upward direction, and brought within reach of the surface soil. Mr. Stephens, in his account of "*Yester Deep Land Culture,*" speaking of this point says:—

"When it has reached the top of the inclined plane, by which it has been elevated nine inches above the bottom furrow, it falls over its ends and sides, bringing in its fall a portion of the surface soil, and both are commixed before reaching the bottom of the furrow, to fill up the void continually forming under the inclined plane or tail-board in its passage through the subsoil. . . . The soil and subsoil are more intimately mixed by this mode of subsoil-trench-ploughing than by the spade, and the reason is easily given. The subsoil-trench-plough raises up a portion of the subsoil by degrees, and rubs it against a corresponding portion of the upper soil, laid over in a furrow slice by the plough that has gone before; and on the subsoil losing the support of the inclined plane of the subsoil-trench-plough, both sorts of soil fall together over the end and sides of the incline upon the bottom furrow; whereas, when soils are mixed in trenching by men, with the spade, masses in spadefuls are placed together side by side, and not in numerable small portions of mixed loose mould. A great difference exists between a mixture of spadefuls and that of loose mould."

It is scarcely possible, however, without actual field demonstration, to convey a perfectly correct idea of the really beautiful manner in which those implements act in loosening and commixing the soil, to a depth of from 20 to 24 inches.

The application of steam to the purposes of cultivation affords another means of effecting that deep culture which enables us to "enlarge our fields of subterranean pasture," as Tull denominates it, in his quaint phraseology. As yet, however, steam cultivation, although a great fact, has not attained that degree of uniform completeness which it will ere long acquire, nor will this be the case until the best points of the different systems which have been brought out are united into one scheme. There are some little jealousies to be overcome before this can be the case, but it is evident that the promoters of steam culture will best further their views and their own interests, and those of agriculturists generally, by consenting to such an amalgamation as that which I have alluded to. In so far as regards the mere act of culture, it appears to me that the smashing-up system adopted by Mr. William Smith, of Woolston, is the best; and notwithstanding the "heavy blows and great discouragements" which it has received at the hands of the judges appointed by the Royal Agricultural Society of England, it evidently appears to be rapidly gaining favour amongst practical agriculturists in many parts of that country.

The effects produced by deep culture are of so wide a range that a full consideration of them would afford abundant materials for a lengthened series of papers. Under the circumstance, therefore, all I can do is to refer to a few prominent points.

It is sufficient merely to remark that deep cultivation, when preceded by thorough draining, increases the absorbent powers of the soil, and thus enables it to imbibe and retain a properly balanced supply of moisture—the excess being carried off—and also of those fertilizing gases which are derived from the atmosphere, and from the decomposition of organic matter within the soil. Furthermore, the air, when thus admitted freely through the soil, exerts a powerful influence on the mineral substances contained in it; decomposing them, and rendering them soluble, and for that reason available as the food of plants. The action of the air "sweetens" she soil, as it is very correctly termed in practical language, and the poor, stiff, forbidding clay, on being subjected to its agency, becomes friable, darker in colour, more fertile, and kindly to work.

Such are the general features of the question, but it is necessary to illustrate them by cases drawn from actual practice.

I have already referred to the deepening of the soil at Marino, and I need scarcely remind you that Mr. Brady is very famous for the heavy and uniform crops of roots which he grows on that soil. At our last meeting, he laid a good deal of stress on the system he has followed for many years, in preparing farm-yard dung during the winter and spring previous to its being applied to the land in root crop cultivation. Whilst I at once admit that Mr. Brady's system of manure management is such as to retain the fertilizing properties of the manure in a much better manner than the ordinary practice allows, still it is worthy of consideration how far the 80 or 90 tons per Irish acre of mangel wurzel, and a corresponding weight of swedes and other root crops, which he annually produces, are due to the deep and thorough pulverization of the soil, which is an essential feature in his practice. Without in the slightest degree detracting from the value of his system of manure making, I am most decidedly of opinion that even his well-made heaps of farm-yard manure would tell much less effectively in the production of crops if the depth of the active soil was still limited, as it formerly was, to seven inches. Of this we have, to a certain extent, corroborative evidence in the results of the "smashing up" system on Mr. William Smith's farm at Woolston, where he succeeded last year, in consequence of his adoption of that system, in growing 55 tons of mangels, and 31 tons of swedes per statute acre, being equivalent to about 90 tons of mangels and 50 tons of swedes per Irish acre. That I am right in attributing the heavy weight of those crops in a great measure to deep and thorough cultivation is evident from the tenor of the following remarks, which occur in a letter with which Mr. Smith has just favoured me, in reply to some enquiries I made relative to the weight of the previous root crops on the same land. He says:—

"The last crop of turnips and mangels, in the same field as last year, was six years ago, and under horse culture, though considered good, did not exceed 20 tons of turnips and 30 tons of mangels. The same field was in turnips twelve years ago, and did not exceed 10 tons per acre. The crops generally round the last year, under horse culture, did not exceed 20 tons of turnips and 30 tons of mangels, even on the best land; but two other persons near me, who have adopted steam and my system, produced nearly as heavy weights as myself."

From this I think there can be little doubt as to the reason why Mr. Smith succeeded in growing 10 or 11 tons of swedes and 25 tons of mangels per statute acre more than he did when he employed the ordinary run of horse culture, and more than his neighbours still do "even on the best land."

At Lois-Weedon, from having only six inches of staple, there is now at least sixteen inches of dark mould, through the constant use of the spade and fork. In adducing this case, I am not expressing any opinion on the general merits of Mr. Smith's experimental system at Lois-Weedon; but that twelve successive crops of wheat have been grown by him without degeneracy or diminution, relying solely on the soil-stores of plant-food which are rendered available by deep cultivation, is a fact which ought not to be overlooked.

I have already referred to the deep culture effected by the Tweeddale plough and the Tweeddale subsoil-trench ploughs, and I now proceed to lay before you some of the results.

The soil on the Marquis of Tweeddale's farm at Yester, previous to its improvement, consisted chiefly of poor, stiff, clay, the surface soil being "generally from 5 to 6 inches in depth, and 7 or 8 inches would have reached the subsoil through the deepest part of the soil." The subsoil consisted of a "poor, hungry, clay, of various colours, and contained many stones and much moor-band pan," the latter being "from the thickness of a film to 3 or 5 inches." The farm lies at an elevation of from 400 to 750 feet above the sea; and Mr. Stephens informs us that the letting value ranged generally from 2s. 6d. to 10s. per acre. Altogether, therefore, to use the words of the talented historian of "*Yester Deep Land Culture*," whose name I have just mentioned, "it is evident that fields with such aspects were by no means promising subjects for the expenditure of capital, with the expectation of a favourable return, either of produce or of interest.*

The first operation was thorough draining, which cost £5 9s. 6d. per statute acre. After this the Tweeddale plough and subsoil-trench-plough were set to work, the combined operations of which cost £2 13s. per acre, making the total cost £8 2s. 6d. per statute acre. I now quote some examples of the results from Mr. Stephens's work on the subject, referring you to the work itself for fuller particulars:—

"The Moss Bents field, which had originally been stiff clay, containing 15¾ imperial acres, was in oats in 1850, which produced 29¼ bushels per acre. It was bare-fallowed and subsoil-trench-ploughed in 1851, and in 1852 produced 61 quarters of good wheat, and 2½ quarters of light, equal to 38½ bushels, and realised above £11 the acre.

"The Long Bents field, of sandy clay soil and subsoil, containing 16 acres, was in oats in 1848, which produced 65 quarters, equal to 37 bushels the acre. In 1849 it was bare-fallowed and subsoil-trench-ploughed, and in 1850 it yielded 58 quarters of good wheat, and 4 quarters of light, realising £10 an acre. In 1851 it was in grass, and in 1852 the lea was deep-ploughed with the Tweeddale plough 15 inches deep. In 1853 it was in oats, which produced 104½ quarters, equal to 61¼ bushels the acre.

"The Wa-Tree Park, which was originally of stiff, tenacious clay soil and subsoil, containing 19¾ imperial acres, was in oats in 1850, which yielded 60 quarters, equal to 28¾ bushels the acre. In 1851, 6¼ acres were bare-fallowed and subsoil-trench-ploughed, and 13½ acres subsoil-trench-ploughed, and made with turnips. In 1852 the 6¼ acres produced, of wheat, 28½ quarters of good and 3½ quarters of light, realising £15 7s. 4d. the acre, and the 13½ acres produced barley, which averaged 31¼ bushels, and realised £6 0s. 10d. the acre.

"The Holmes Park, which was originally of very poor, stiff, tenacious clay soil and subsoil, and containing 24 acres imperial, was in grass in 1850, and was deep-ploughed, 15 inches, with the Tweeddale plough in winter. It carried oats in 1851, which yielded 108 quarters, equal to 43¼ bushels the acre. In 1852 it was subsoil-trench-ploughed 19 inches deep for turnips, which were a fair crop. In 1853 it was barley, of which 79½ quarters were good, and 18 quarters light, equal to 39 bushels, realising £9 17s. 6d. the acre.

"The Kitchen Croft, which was originally of stiff, sandy, clay soil and subsoil, containing a large number of boulders, and consisting of 8¼ acres, imperial, was previously let at £8 15s. *for the field* [it appears to have been one of the best fields], and it was thorough-drained in the winter of 1848. In 1849 it was bare-fallowed and subsoil-trench-ploughed 19 inches deep. In 1850 it carried wheat, of which 24 quarters were good, 5¼ quarters light, equal to 34½ bushels, and realising £8 8s. 8d. the acre. In 1851 it was in turnips, which were good. In 1852, barley, of which 40 quarters were good, and 3¼ quarters light, equal to 53 bushels the acre, and was sold for £10 12s. 10d. the acre."

I might continue quoting similar examples from Mr. Stephens's account of the improvements at Yester, but the foregoing are quite sufficient to show the very satisfactory nature of the results in a financial point of view. The expense of draining and subsequent deep ploughing was paid by the first crop, and in the case of turnips the produce has been fully doubled. The returns from the land when in grass are also remarkable. "The wheat and barley grown on the Yester farms now realise the top prices in the Haddington market," which, as Mr. Stephens very properly remarks, "is a severe test on the value of any grain presented at it, inasmuch as grain is shown there that has been raised on as good soil, as favourable a climate, and with as much skill as in any district of the kingdom. But wheat that has attained 66lbs., barley 57lbs., and oats 44lbs the bushel, need not fear competition in any market, and from any locality."

Furthermore, a saving of 25 per cent. has been effected on the horse labour on the farms, twelve horses being now able to accomplish as much as sixteen horses previous to the improvements; there is also a saving in manual labour, and in the purchase of certain implements, such as clod-crushers, rollers, grubbers, &c.; and all this is done, *not by abandoning tillage*, but by conducting it in a better manner. Besides all this, the annual value of the land has been increased four to five fold; that is to say, land which formerly did not exceed 8s. to 10s. an acre in value has now become worth 40s. the acre.

The Yester system has been very zealously, efficiently, and extensively carried out on the estate of Blackhall, co. Louth, near Drogheda, a full description of which was given in the *Farmers' Gazette*, Sept. 3, 1859. In this case the original soil was even of a more forbidding nature than that of the Yester farms, the active portion being only three or four inches in depth, and a cold, stiff, yellowish gray clay, full of boulder stones. After being drained, the result of the Tweeddale system has been to raise the produce of wheat from 8 barrels, or 160 stones the Irish acre, up to 13, 14, and 15 barrels, without the application of manure. The quality of the grain is at the same time good. Heavy crops of grass are produced on land which only yielded pasture of a miserable description previous to the application of deep culture; the root crops have also been very satisfactory, and altogether the 160 statute acres which have been subjected to this mode of treatment at Blackhall present abundant evidence of the immense value of a properly regulated system of deep culture, and of the peculiar advantages which the Yester mode affords of effecting this object. I ought to remark that the local position of Blackhall is unfavourable for procuring manure, other than artificial manures —even lime not being easily obtained—and one great object, therefore, which has been kept in view whilst carrying out the system of deep land culture, has been to ascertain how far that system operates on the after-fertility of the soil, without the aid of even ordinary supplies of farm-yard or artificial manures.

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* *Yester Deep Land Culture*, by Henry Stephens. Blackwood and Sons, Edinburgh and London.

Mr. Robert Bowles, of Cloghranhuddart, co. Dublin, has not only used the Tweeddale plough extensively himself, but has been the means of inducing others to procure it. He uses it regularly in the ordinary cultivation of his farm, and considers that, besides the additional depth of soil which is gained, one ploughing by the Tweeddale plough does more in preparing the land for green crops than ordinary ploughing followed by a deep grubbing. As an illustration of the results produced by deep cultivation as effected by the Tweeddale plough, in connection with Mr. Bowles' case, I may mention that some five years ago he grew a crop of wheat after lea in one of his fields. This was succeeded in the following year by oats, the produce of which did not amount to more than 10 barrels—140 stones—per Irish acre. In consequence of some rearrangement of his fields, it was found necessary in the third year to crop part of this field again with oats, but before doing so it was ploughed 15 or 16 inches deep by means of the Tweeddale plough, and the result was, that the produce was actually doubled, amounting to fully 20 barrels an acre. If the land had been ploughed in the ordinary manner 5 or 6 inches deep, it is doubtful if the second crop of oats, being the third cereal crop in succession, would have reached 8 barrels an acre, so that the additional 12 barrels were fairly attributable to the effects of the Tweeddale plough.

I might also adduce Dr. Peart's experience of the Tweeddale plough, as well as that of other parties as illustrative of the effects of deep culture, but I feel sure that further remarks are unnecessary.

In conclusion, permit me to remind you that the increased fertility derived from deep culture demands a corresponding return of those mineral matters which are abstracted by the produce, whether it be grain, roots, or grass. It is true that the results of deep cultivation apparently foster the idea which some have put forward, to wit, that it is a substitute for manure. This is not the case; it is an unlocking of the treasures contained in the great storehouse of the soil; but the supplies which we draw from thence at one time must be replaced at another, otherwise they will ultimately cease. It would be foolish, however, to allow such a consideration to operate against thorough tillage; and I would close these remarks by reminding you of the pithy saying of Poor Richard, otherwise Benjamin Franklin—

> "Plough deep, while sluggards sleep,
> And you'll have corn to sell and to keep;"

or of the declaration drawn from a still higher authority, "He that *tilleth* his land shall be *satisfied* with bread."

Mr. Pringle laid on the table specimens of various soils, viz., (1) From Blackhall—subsoil trenched in April, 1857, and since manured three times with dung, and twice with coal ashes. (2) From do., same description, burned once, and twice manured in same period. (3) From do., same got frequent tillage alone during the last three years. (4) From do., subsoil taken up April, 1860. (5) From do., subsoil taken up April, 1857. (6) Boulderstone from subsoil of Blackhall. (7) Garden soil from Blackhall, after several years' tillage and manuring. (8) Fossil shells from soil of the Golden Vein. (9) Soil from East Barnes, near Dunbar, East Lothian, 400 statute acres let for 2,000 per annum.

At the conclusion of the paper, Mr. Pringle was warmly applauded.

Mr. **Brady** said he felt it due to Mr. Pringle to bear his testimony to the merits of the very valuable paper which he had read, and to the value of deep cultivation of the soil. He had tried it repeatedly, and every year's experience proved to him, and more firmly convinced him, that thorough draining and deep cultivation of the soil were the very foundations of high and successful farming. With reference to the Tweeddale ploughing, he observed that the cost was £2 13s. the statute acre, and the cost of spade and fork work at Marino was £8 to £8 10s. per Irish acre. Still, he should differ with Mr. Stephens on his system of subsoiling, inasmuch as he took a portion of the subsoil, and put the active soil down, and he never saw any plough that could take so even a breadth of furrow, at 18 or 20 inches in depth, as the spade and fork. The process of subsoiling with the fork or the spade is carried on here as under:—A space of 20 inches or 2 feet in breadth, and the whole length of the ground, is marked out with a line, and the surface or active soil entirely removed therefrom, and left at the other end of the ground, for the purpose of filling up the last opening when the work is being finished. The subsoil is then deepened to any required depth, care being taken to have the furrow or trench as *wide* in the *bottom* as it is at the top. This being done, the active soil is turned upside down on the broken subsoil, and so on to the end. The fertility of ground thus treated, independent of its greatly increased produce, can be maintained, and its after-cultivation carried on with much less expense than it ever could be in its original state.

Dr. **Cameron** said that before making a few brief observation with reference to one or two points touched upon in Mr. Pringle's paper, he might be permitted to observe that the essay—for he believed essay was the proper term to give the paper which had been brought before the meeting—was one of very considerable public importance indeed; it smacked of that intensity of practice which was so eminently characteristic of all Mr. Pringle's writings (Hear, hear). Mr. Pringle had very clearly shown that the pulverization of the soil was absolutely necessary to its continued fertility; but he had just as clearly shown that the most perfect mode of pulverization would not obviate the necessity of manuring the land. It might apparently do so for a long period, and more particularly so in the case of heavy lands, which were frequently known to yield successive crops of the most exhausting character for a considerable period; but as Mr. Pringle had clearly shown in his paper, the time would come when soil so treated—no matter how fertile it might be—would be reduced to absolute, and perhaps irrecoverable, sterility. He did not think that abundant manuring could very long pay for the want of proper tillage (Hear, hear); on the other hand he was convinced that the very best mode of culture would never do away with the necessity for manure. Such as had good heavy soils might hope, by finely pulverizing it, to get, without the application of manure, crops year after year; but it was evident that in such cases they would be drawing in advance upon the resources of the soil, and, indeed, would be doing nothing less than beggaring their children. Mr Smith, in the Lois-Weedon system of tillage, had gone to an extreme in cultivation, but others, on the other hand, had gone to an opposite extreme with respect to manure, thinking that the soil ought to be regarded as a mere vehicle in which to grow the plants. The deficiency caused by the crops taking the available mineral ingredients out of the soil is in part made up by tillage, or rather the preparatory cultivation of the soils, which sets fresh stores of fertilizing materials to supply the wants of vegetable life. Whilst he was altogether disposed to agree with Mr. Pringle, that they ought to till the soil in the best way, he also quite agreed with Mr. Brady, that the fork and spade appeared to be, in many instances, better than the plough. Mr. Brady's cost of subsoiling appeared to be £8 the Irish acre, but the subsoil plough appeared to have effected the same object for £2 13s., or about £4 6s. per Irish acre. If Mr. Brady's system and Mr. Stephens's system accomplished the same results, with the difference of cost no one could for a moment maintain that Mr. Brady's system merited general adoption; but if Mr. Brady's system produced much heavier crops than could be produced by the adoption of the subsoil plough, they ought to favour Mr. Brady's system, because, by the adoption of his plan, there was a greater amount of human labour brought into operation, and in a country like this, with a large agricultural population, that surely was a matter of importance. As, however, the two systems had not been contrasted in a pecuniary sense, and as they had no figures before them to show whether Mr. Brady's method of subsoiling or that of Mr. Stephens led to the better results for the cultivator, he should dismiss that subject by repeating, that if the results were alike to the cultivator, he certainly thought they should adopt the system which encouraged manual labour. He quite agreed with Mr. Pringle in deprecating the Lois-Weedon system of tillage; he had very clearly shown that that system was not based on a foundation of truth, and that its adoption in the cultivation of the light lands of Ireland would eventually lead to the serious deterioration of the soil. Our present system was certainly not the best that could be, but it was preferable to that of Mr. Smith, and which Mr. Burnett had after him introduced. They ought to be very much obliged to Mr. Pringle for his very practical paper, and he hoped that at succeeding meetings of their section, papers of the same practical character would be brought forward (applause).

Mr. PRINGLE said that the results of deep culture on the Tweeddale system at Yester and Blackhall were alone sufficient to show the great increase which took place in the value of the land, and, consequently, the profitable nature of the system. He was afraid the time was past when they required to devise means for employing "a large agricultural population," which certainly did not exist in this country.

The CHAIRMAN remarked that with regard to the Tweeddale or Yester plough, he had been in the habit of ploughing about twenty inches deep, and it would plough the full length and breadth, and did not go in a slanting direction. He would be most happy to give Mr. Brady a loan of the plough, in order that he might fully test it with his forks and spades. The difference in the cost per acre was very considerable, and he did not think that hand labour should be always preferred at such an enormous difference; for he did not think there was any danger in our time of ever seeing hand labour superabundant. He thought it was incumbent in every one to work improved implements. He knew from his own small experience that when the land was once gone over, it was improved for a long time afterwards. The fields which he operated on were greatly changed; and not only had they been benefited the first year, but they had a corresponding benefit for years. The results were still very encouraging, and there was nothing at all to prevent the adoption of deep ploughing. He lent his plough to several people, and in every instance it was approved of, except one, where the land was too stony, and the plough could not be dragged through. He did not think they could ever take 20 or 30 corn crops from the soil in this country; but he had known instances in which many successive crops had been taken from the soil.

The next meeting of the section will be held on the first Tuesday in June, when Mr. Robert Bowles will read a paper on "deep ploughing."

ANALYSES OF MANURES.

We are far from desiring to discourage the value of analysis when made for such objects as can be answered by the chemist; but the general supposition that the value of any manure may be properly estimated by the analysis of the whole of its quantity, is simply ridiculous. We shall presently show one instance at least in support of this assertion. We freely admit that when it is known that a compound contains phosphate from the bones of animals, or potash from organic sources, that then an analysis determining the amount of phosphate, or the amount of potash contained in such mixture, is valuable. But, let us suppose a case where analysis will have no value:—Should we take one hundred pounds of the phosphatic rock of Dover, New Jersey, grind it to a powder after having heated it to a red heat and then dried it with fifty-six pounds of sulphuric acid, or suppose we should add to it twenty-five pounds of ground felspar, containing seventeen per cent. of potash, and then send it to a chemist for analysis, his report would set forth a large amount of super-phosphate of lime and of potash, and of course would take no cognizance of the condition of this super-phosphate of lime or its immediate origin, and it would be pronounced manure of high value, certainly at a higher value per ton than any Peruvian guano or bone phosphate in the market. But what would be its real value for use as a fertilizer? We claim that phosphate so made would not be worth half-a-crown per ton, while that properly made from the bones of animals, containing the same amount of phosphate, with potash added taken from organic sources, would be worth £10 per ton. This is one instance which fully answers the general call for analysis as applied to fertilizing materials.

We are not ready to say that chemistry cannot be applied to the analysis of manures, but we simply say that thus far it has not been so applied. Maryland, for instance, has appointed chemists to examine the phosphates imported into the Baltimore market, and the analyses made by these chemists always set forth the amount of phosphate of lime, but of course can take no cognizance of the source from whence this phosphate is obtained. Thousands of tons of phosphate of lime, made in whole or in part from phosphatic rocks or from volcanic guanos, have been placed in that market, and sold in preference to bone phosphate, under analysis, and proved to be far its inferior.

As to soil analysis, we believe that if the chemist would boil the soil in dilute acetic acid for twenty minutes, and then make an analysis of the portions in solution, such analysis might be useful to the farmer, as it would inform him what amount of pabulum the soil contained, which could be appropriated by crops within the current one or five years. But of what use can an analysis of the whole soil be to the farmer? It simply represents the entire constituents, whatever may be their condition, and thus inventories what would be developed by nature's laws from the soil during all time, from the present to the day of judgment. But, as the farmer does not expect to remain active in his profession for all that time, the analysis is useless to him. He wants to know what there is in the soil which by proper manipulation will be transformed into plants, during a practical length of time; instead of which, the chemist informs him of *all* his soil contains, as if his whole farm, to the depth of a foot, could be changed into crops during an ordinary four-course shift. This is indeed science run mad, and still this is the style of analysis which every importer of guano or other fertilizing material demands of the chemist, and it is precisely what he gets.

Can any one believe that the soil, in the vicinities where felspar rock prevails, may not be short of potash? Still upon microscopic investigation the soils will be found to be made up, in part, of particles of felspar, the debris of the rock. Can any progressed plant feed upon the potash contained in these particles? And notwithstanding that all the potash now on the globe had its origin in the felspar and other potash-producing rocks, still the addition of wood ashes to these soils invariably produces an increased crop. Is it not true of the limestone soils of Westchester, that, without the addition of lime, they can scarcely be made fertile?

We are inclined to think that the chemist should never give his analysis of a manure as a guide to the farmer, without stating it somewhat in this way:—"Amount of superphosphate, of organic origin; amount of potash, from wood or other vegetable ash, etc.," instead of roundly asserting a certain quantity of phosphate of lime, or a certain quantity of potash, without the slightest reference to the source whence they were obtained.

We have before us an analysis of manure composed in part of dried bullocks' blood, and that portion is simply noted as "organic matter dissipated at a low heat," leaving it to be inferred that it has no value; and then, noting a certain amount of chloride of sodium belonging to this blood, and in parenthesis the words "common salt," as if chloride of sodium as it exists in blood had no greater value than common salt: sulphate of lime consequent upon the decomposition of bone, and worth to the farmer twopence per pound, as compared with ordinary sulphate of lime, in the native state as "*Plaster of Paris.*" Now, from such an analysis, how is any farmer to judge of the true value of this manure, and how is any chemist to present any other kind of analysis, except the specimen submitted be fortified by the affidavit of parties showing the sources from whence the constituents arise? If the chemist stated the portion dissipated at low heat to be the dried blood of an animal, and fairly set forth its value as a fertilizer, and that the sulphate of lime is that consequent upon the decomposition of the bones of an animal by sulphuric acid, and that the chloride of sodium, instead of being the equivalent of common salt, has many times its value as a manure, then the farmer might be guided by such analysis to the extent that he understood the value of such constituents from such sources. It at least will leave the question where it belongs, for experiment to decide the difference between phosphate from the rock and phosphate from the bone; between potash as found in felspar, and potash as found in organic life; between chloride of sodium as existing in the blood of an animal, and that existing in rock salt as imported from Turk's Island.

Every agriculturist, who is also a practical chemist, is well aware that, until within a few years, chemists have failed in rendering themselves useful to the agriculturist, and even at this time but few have experimented in the field sufficiently to know the extent of the errors perpetrated in the laboratory, in the analysis of manures, soils, etc.

Such of our readers as are not sufficiently intimate with this subject to understand our precise position, may ask us if we have not made soil analysis, and founded our advice upon such analysis, which included the entire composition of the soil? We answer yes, and always to the profit of the inquirer; the reason, however, was that we always recommended the use of such constituents as were absent, or nearly so, from the soil, and therefore it was benefited. But we now know that many constituents which we found by the ordinary method of analysis present, and which were in an unprogressed condition, should also have been added to these soils, and derived from organic sources. Had our advice included these, the benefits would have been much greater to the required crops. In other words, an analysis of the entire soil *progressed and unprogressed*, must show the absence of any missing constituent, but of those; reported as present, some may be in an *inert condition.* Thus an analysis of a soil containing felspar would give potash, but still the potash contained in felspar is not available to plants of a higher order. Before our discoveries in relation to the progression of primaries, we, in common with all other chemists, were in error on this subject to the extent noted above.—Working Farmer.

FARMING WITHOUT THE PLOUGH.

Not spade-husbandry, but tillage by horse or steam-worked implements, such as the grubber or "cultivator," forms the subject of our inquiry into some old-fashioned practices. It is interesting to find (as in our last number) the rudiments of the present Woolston system of husbandry already introduced in the last century—stubbles cleaned and prepared by a grubber, then manured, and thrown into ridges or baulks by a double mouldboard or trench-plough, and beans drilled on the top. And the reasons alleged by those early experimenters for their enlightened practice were (as we have seen) similar to those which Mr. Smith inculcates: "The plough plants root-weeds, rather than destroying them; therefore, clean the land by the grubber and skim"—so indispensable a process in preparing bean-stubbles for wheat, that Arthur Young relates the custom in one whole district of *hand-hoeing* the stubbles, and then drag-raking them, the necessary horse-implement not being known there at that time.

In 1792, "skimming" pea and bean-stubbles, and then once ploughing for wheat, was a newly-introduced practice in Essex; and these crops, horse-hoed and succeeded by such an autumn fallow, were found to be a great gain over the bare fallow, as a preparation for the wheat. Crops soon came to be put in without ploughing at all. In 1798, Mr. Ellman, of Glynde, Sussex, broadshared a pea-stubble, and sowed rape without ploughing. This yielded a great crop of sheep-feed. The piece was then worked for turnips, and these fed off in time for wheat.

Young, in his "Farmers' Calendar" (1809), says: "If the young farmer has a bean-stubble on which he intends sowing wheat, he should be as early as possible in giving it the due tillage. This will depend on the soil; for on some *it will be more advantageous to trust to the skim, scarifiers, and scufflers, than to the plough.* If the land is very clean, the great Isle of Thanet skim will cut through everything, and loosen the surface sufficiently to enable the farmer to leave it as clean and fine as a garden, women attending to pick and burn. If less clean, the Kentish broadshare may do the work more effectively. In other cases, the scuffler may be equal to the business. When he has got the surface to his mind, he is to consider *whether or not he should plough it,* which is advisable if the soil be of a firm, solid, tenacious quality, and if he does not intend to drill the wheat. If he ploughs such a soil, he may not have any apprehension of root-fallen wheat, failing roots from a loose bottom; but he will bring up a new surface, that may drill with difficulty, whereas *that which has received the influences of the crop, atmosphere, and of his late operations, will be in exactly the right temper for the drill to work in.* If the soil is of a more loose, friable quality, and he should plough down the fine surface he has gained, he will give the wheat too loose a bottom, and he will run the chance of a root-fallen crop. In such cases, he should determine *not to plough at all, but drill directly*—a method in which he saves tillage, and has the probability of a better produce. This is a new practice on strong land; but I have seen such success in it as leaves no reason for doubting the soundness of its principles." In referring to barley after turnips, he says: "The husbandry universal in the kingdom, till very lately, was that of ploughing such land once, twice, or thrice for spring corn. Upon very dry soils the evil was little more than that of a useless expense; but upon all other soils more stiff and unmanageable, the surface which had been rendered friable by the frosts, being turned down, and the more stiff and clayey bottom not influenced in the same manner by those natural agents being brought up, that might also, if very favourable weather ensued, be brought into good order; but if the season proved the least unfavourable, the farmer could have no chance of obtaining so fine and safe a tilth as the surface was capable of without any such reversal of it by ploughing. The new system is, to apply the scarifiers instead of such ploughing. Mr. Cook's, with his cast-iron beam, or any other heavy enough, is used, the horses walking only in the furrows, and consequently without any trampling of the land. These scarifiers are of different breadths, but all narrow—usually about three inches, or at most four; and they will go as deep as may be thought proper. They ought to stir to the depth to which it would have been ploughed, whether four, five, or six inches. They completely loosen the soil, let down the air to dry it at bottom, give a very good tilth, with the material advantage of not burying that pulverized surface which frosts have given, and which, if once lost, may not be regained in time for barley. In some cases, one scarifying and two or three harrowings will effect the preparation; in others, two....This system has for a few years past been making a rapid progress in Suffolk....The operations go off very quickly, and leave the lands or stitches in excellent order for the drill-machine to follow and deposit the barley-seed, the farmer, during the whole of these operations, being as little liable to be thrown out by unfavourable weather as it is possible he should be, and much less so than if he had ploughed the land."

Let us now make a more detailed inspection of some advanced farming in the olden time. Going back a hundred years, we meet with Mr. Ducket's improvements in tillage, first at Petersham, and afterwards at Esher, in Surrey, on a sandy soil. The mind of this practical agriculturist was fertile in resources, and his management was original, and at that time unrivalled in mechanical husbandry. For more than thirty years his farms were the resort of every man who figured in the agricultural world; and even His Majesty, King George, visited Mr. Ducket in 1769, on the farm at Petersham, which he rented of Lord Dysart. Mr. Ducket astonished his contemporaries by starting novel notions, the fruit of his sensible observance of nature. He never stirred sandy soil in hot dry weather. "At such a time," he said, "every stroke of the hoe does mischief: my hoeing, if possible, is done in wet weather." And he demonstrated how totally contrary the management of wet and dry soils are. Lady Dalkeith, whose house looked on a part of his farm, thought him mad for apparently cutting-up and absolutely destroying a very fine-looking field of rye, by carting clay or loam upon it in winter, till nothing green was to be seen; and was more surprised afterwards to find the crop recover, and prove a great one. He became famous by his trenching-plough, consisting at first of one plough-body above and before the other, and afterwards taking the form of a single plough preceded by a strong skim coulter. For this invention the Society of Arts awarded him fifty guineas, and the Board of Agriculture presented him with a gold medal. The following is curious in these days of Bedford ploughs and steam cultivation. The Board say, "The offer of fixing the skim-coulter to any plough sent him is a very valuable one, as it takes away the necessity of buying an expensive tool, and requires only that a coulter be sent to Mr. Ducket with the measure of distance from the share to the beam; he can then fix the skim to it. This tool is perhaps the most important invention in agriculture for the last fifty years."

The Petersham farm, when he first entered on it, was a hungry sand, and several acres covered with gorse and brambles; yet his course of husbandry for nineteen years rendered it flourishing in his hands, though his three predecessors had failed on it. In describing the management, a Mr. Robinson, writing to Arthur Young, in 1787, says: "As I find that Mr. Ducket's great modesty prevents his standing forth among your correspondents, I will attempt to describe his mode of cultivation rather than it shall remain unnoticed in your annals." His course of husbandry was to employ clover, turnips, and rye, as fallow crops, and as intermediate ones between wheat, barley, oats, and rye, changing these occasionally according to the nature of the land; and he would sometimes gain thus four or five good white corn crops in succession. His implements were—1st, a trench-plough, as above-mentioned, for ploughing two furrows deep, requiring four to six horses, according to the depth; 2nd, a double-furrow plough, ploughing two acres a day; and 3rd, a drill plough. The double-furrow or two-share plough was not new, as Ellis published a print of one in 1732. It was a common implement in Warwickshire for many years before Mr. Ducket; was known in Somersetshire, and afterwards brought into extensive use by Lord Somerville. He invented many other tools, and Young eulogises him as "certainly one of the great agricultural geniuses produced in the present reign to carry the husbandry of the kingdom to something of that perfection which manufactures have so rapidly attained. Arbuthnot, Ducket, Bakewell!—three men that were equal to the improvement of an empire, had there been as much industry to copy as they exerted talents in setting example. Much has been done in live stock, but tillage has not advanced with equal steps."

Mr. Ducket gave one deep ploughing with the trench-plough to every other or third crop, with very shallow intermediate ploughings with the two-share plough. By deep ploughing fresh earth is brought up for the nourishment of the plants; by not repeating it too often the moisture is retained in the soil, being not too loose to draw off the wet, and yet not too hard to impede the penetration of the roots of the plants into it. The shallow ploughings with the two-share plough loosen the soil sufficiently for the seed to take root, until it has strength enough to penetrate into the first broken earth. Arthur Young observes upon this—"There is something very masterly in this practice, and not absolutely requiring any other than the trench plough; for, having once stirred of a sufficient depth, and buried all spontaneous growth, *scuffling alone* would do all the rest, till another trench-ploughing became necessary."

Mr. Ducket thought that frequent ploughings brought up the buried seeds of annual weeds so abundantly, that in a grain crop it was difficult to destroy them; and that when the land is constantly ploughed to the same depth, the rain water is lodged between the loosened and unmoved earth, where it stagnates and injures, instead of assisting vegetation. He preferred furrows of nine inches breadth; sowed all crops, except turnips, broadcast, upon drills opened with his drill-plough; drilled clover among the corn, and hoed his wheat with a horse-hoe having ten hoes. He had no fixed rotation of crops, thinking that every farmer ought to study what grain will pay him best, which was the only rule he followed, except in bad seasons. All he required was to get a feeding crop between those of grain, and renew his soil by alternate deep and shallow ploughings. He did not object to wheat after oats; but wheat after barley, or oats after oats, were always weak crops: whereas, barley following barley he made answer well, with proper dressings, for ten years in succession. If land required rest, he laid it down with grass seeds, which prepared it, after proper culture, for producing the grain most called for in the market. He grew wheat three years in succession, sowing turnip-seed broadcast among the growing crop when in full ear; thus getting an intermediate feeding crop, fed off and sown to wheat again by Christmas. While he considered fallows to be necessary for strong soils, as the clods of earth could not be well broken to pieces without lying some time exposed to the air, he rejected the practice upon light soils, where feeding crops are better—the cattle, while consuming the crop, treading the soil, rendering it more compact and firm. Thus, instead of letting light land lie fallow all winter, he had it occupied with a feeding crop of rye, turnips, or tares.

NOTES ON MEADOWS AND PASTURES.

By JAMES BUCKMAN, F.G.S., F.L.S.,

Professor of Botany and Geology at the Royal Agricultural College.

The Economic Relations of Irrigated Meadows.

The high rent of irrigated meadows pre-supposes that they possess great advantages, not only from the circumstance of their abundant yield, but also from some important economic relations in connection with the rest of the farm; and we therefore now propose to review this subject under these two aspects—viz., first, to consider the quality and quantity of the herbage of an irrigated meadow; and secondly, to point out the advantages of such meadows; especially under the circumstances previously described.

1st. *The Herbage.*—From what has been already advanced, it will be seen that soon after irrigation is established a great change takes place in the natural or original herbage of the field; and the direction which this change takes is that of killing out most other plants—other than grasses—increasing the growth of grass itself, so as not only to fill up the gaps caused by the death of plantains, daisies, and such plants as by reason of their close growth to the soil occupy much space, but also by augmenting the development of the different grass individuals, and that not only as with ordinary meadow for one crop, but for two, or sometimes three crops, each of more than average quantity for the same meadow if not irrigated.

Again, it should be noted that this increase is due solely to the action of the water, which appears to be in itself *manurial*, as containing some of the elements upon which grasses especially feed; *chemical* by reason of the solvent powers of the water; and *climatal* from the important circumstance that a meadow through which water can be kept in motion is much warmer than an unirrigated pasture, as may be evidenced from the beautiful green colour of the irrigated, when compared with the winter brown and grey aspect of ordinary pasture. Hence, then, special manuring forms no item in the expense; and moreover, it must be borne in mind that a yearly crop of hay, either as a primary or secondary *math*, is always to be had in such meadows. But still some expenses have to be provided for, which it will be well now to glance at; and these consist of matters which will be understood from the following items of expenditure in the district we have chosen to describe as illustrative of this subject:

Interest upon the original charges for laying out the meadow in a proper and convenient form for getting the water on (through) it, and ensuring facilities for its constant motion towards the outfalls;

Charges for the reparation of flood-gates and other engineering requirements; labour of drowner in clearing conduits, regulating the supply to different parts by means of *stanks*, weeding, &c.

(All this he usually undertakes at a certain sum per acre, which is regulated very much according to the quantity in the neighbourhood, one man thus acting for several proprietors);

Compensation to proprietors and mill-owners for the use of the water.

These items usually average an annual cost of 6s. per acre, so that the extra charges upon the rent of water-meadow are not very heavy; at the same time, the fact that these meadows let for as much as £5 the acre, the spaces used for the conduits, pools, flood-gates, and the like, being reckoned in the acreage; and Lord Bathurst, who is a large proprietor of irrigated meadows about Cirencester, lets much of them for this rent, but within the last few years he has preferred to keep them in his own hands as *addenda* to his fine farm at Oakley Park—a fact in itself speaking well for the results of the process by which they have been made so valuable.

As regards the causes which contribute to the increased fertility of grasses where water can be got for their irrigation, we are still to a considerable extent in the dark, as even the purest water, if let through a meadow in the manner indicated, will exert an influence almost equal to water charged with chemical matters, if these matters be not of large extent; at the same time, it must be borne in mind that sewage waters sometimes aid in the production of crops of an almost fabulous amount.

The truth, perhaps, lies in the facts as brought out by analysis, that grass and hay of the irrigated meadow are, after all, not rich in mineral constituents, but become especially so in feeding properties; and hence their special adaptation to the peculiar uses of early feed for fattening lambs and renovating the ewes, which we shall presently see is so extensively taken advantage of by the Cotteswold farmer.

These facts will best be shown by quoting the valuable analyses of grasses by Professor Way; and we would introduce the following table with his own remarks upon some of its important results.

"The most remarkable specimens in this table are the water-meadow grass (first crop) and the *Dactylis glomerata* (with ripe seeds). Both in the quantity of nitrogen and fatty matters, the water-meadow grass nearly doubles the other grasses in the table. This meadow was composed principally of the grasses *Poa trivialis, Holcus lanatus, Hordeum pratense, Avena pratensis, Lolium perenne*, &c., in none of which do we see the peculiarity which unitedly they show in the meadow. Are we to attribute the high proportions of fat and flesh-forming principles to the action of the water in irrigation? If so, we have indeed in it a most important and powerful agent."—Professor Way, in the Journal of the Royal Agricultural Society, vol. xxxi., p. 182.

Now, that we must so attribute the increase of value to the feeding properties, which, under the special circumstances, are the most valuable constituents of a grass, is quite evidenced by the presence of (out of the five grasses above named) at least three species which especially indicate the greatest poverty of soil.

ANALYSES OF NATURAL GRASSES.

(In 100 parts of the Grass dried at 212° Fahrenheit.)

Name of Plant.	Albuminous, or flesh-forming principles.	Fatty Matters.	Heat-producing principles: —Starch, gum, sugar, &c.	Woody Fibre.	Mineral Matter, or Ash.
Anthoxanthum odoratum	10.43	3.41	43.48	36.36	6.32
Alopecurus pratensis	12.32	2.92	43.12	33.83	7.81
Arrhenatherum avenaceum ..	12.95	3 19	38.03	34.24	11.59
Avena flavescens	7.48	2.61	47.08	35.95	6.88
Avena pubescens	7.97	2.39	49.78	34.64	5.22
Briza media	6.08	3.01	46.95	35.30	8.66
Bromus erectus	9.44	3.33	82.02		5.21
Bromus mollis	17.29	2.11	38.66	36.12	5.82
Cynosurus cristatus	11.08	3.54	52.64	26.36	6.38
Dactylis glomerata	13.53	3.14	44.32	33.70	5.31
Ditto seeds ripe............	23.08	1.56	26.53	43.32	5.51
Festuca duriuscula	12.10	3.34	40.43	38.71	5.42
Holcus lanatus	11.52	3.56	39.25	39.30	6.37
Hordeum pratense	11.17	2.30	46.68	31.67	6.18
Lolium perenne	11.85	3.17	42.24	35.20	7.54
Lolium italicum	10.10	3.27	57.82	19.76	9.05
Phleum pratense	11.36	3.55	53.35	26.46	5.28
Poa annua	11.83	3.42	51.70	30.22	2.83
Poa pratensis	10.35	2.63	43.06	38.02	5.94
Poa trivialis	9.80	3.67	40.17	38.03	8.33
Grass from water meadow	25.91	6.53	32.05	25.14	10.37
Ditto second crop	10.92	2.06	43.90	34.30	8.82

The above examples were obtained in the Cotteswold district.

2nd. *The Economics of Irrigated Meadows.*—In discussing this subject, we must bear in mind that the district which will have the requisites for irrigation in the greatest perfection will be usually that of an elevated or hilly country, composed of a porous stony stratum at the hill tops (the water-collecting medium), and intersected by valleys scooped out of clays (the watershed strata), covered up by the gravelly *debris*, the result of the denuding action by which such valleys were formed. Here then the table-lands will be dry, and consequently bare and bleak in the winter, and even its little herbage will be late in the spring. And, again, if we bring the argument specially to bear upon the central, or Cotteswold chain of hills of England, it applies with double force, as natural meadow is there so scarce that the vales must be looked to for pasture, and as these are usually narrow, and intersected by a rivulet running more or less through its centre, it seems a most wise provision to aid in the augmentation of meadow, besides ensuring its early productiveness, which is supplied in the facilities for the application of irrigation.

The following quotation puts this matter in a clear light:—

"There are also some good water-meadows on the Coln, Churn, and other small rivers (of Gloucestershire). Those meadows produce an early and abundant supply of grass for ewes and lambs, and other stock, which is exceedingly useful in spring. The custom is to consume the first crop by keeping the sheep on the land till May, when other grass and green crops are ready to take the stock. The water is then turned on again, and the second crop is mown for hay about the latter end of June, or beginning of July. The water is turned on a third time, and the aftermath which succeeds is fed off, which generally lasts until towards Christmas."—Bravender "On the Farming of Gloucestershire," Journal R. A. S., vol. xi.

Seeing then that the value of irrigation is so fully recognized, it will not be a matter for surprise that water-rights, by retaining which alone the process can be accomplished, should be so jealously watched, and this not merely as a matter of residential convenience as supplying ornamental waters or fishing streams; not merely as a matter for the consideration of mill-owners; but really as a subject at the bottom of a widely-extended and peculiar system of agriculture.

Hence, when in 1854, the Water Works Company of Cheltenham, in the vale of Gloucester, applied to Parliament for powers to divert one of the largest tributaries of the Thames towards the Severn Valley, for the use of that fashionable town, there need be no wonder that those interested in the said stream opposed the project.

Now, the first opposition was attempted to be met by the promise of a "compensation reservoir," by means of which it was alleged that in winter the surplus water of the stream would be stored up, so that the million gallons a day, which was to have been abstracted all the year round, could thus be provided for, and, as was asserted, there would even be sufficient in this store to be given to the mill-owners and others lower down the stream in the height of summer, the usual season of drought. However, it was shown in the geological evidence, that in a district so constituted, there was no surplus water, as in a region of porous strata there could be no floods, though there would be an abundance (dependent upon the amount of rain-fall) of springs and rivulets which would be tolerably equable in their flow, and that the whole of this, and more if it could be procured, was required for the exigencies of the farmer; so that the following conclusions, which were then arrived at, will probably be considered as fully sustained from the whole arguments of the present paper—we place them as separate postulates:

From the porous nature of the subsoil of the Cotteswolds—or elsewhere under similar circumstances of *pervious* stonebrashes—irrigation is of great value.

Indeed, it is only practicable in such situations, because the water can readily percolate through the soil; whilst on the clays of the vale of Gloucester (being impervious) it would remain stagnant.

Here, then, robbing the Cotteswolds of this means of fertilization would do serious damage; whilst taking the waters from the vale clays would be doing good.

As irrigation is being practised to an increased extent every year, and as the amount of produce is more than quadrupled thereby, it would be serious to take away this means of improvement, more especially as the present amount of water is scarcely sufficient for residential and agricultural requirements.

On referring to our table of the positions occupied by different species of grasses, it will be found that we have still to mention those which occupy or would be suitable for the following positions:

5. Grass glades.
6. Covert.
7. Lawn.

5. *Grass Glades.*—These are such as will usually be found to occupy positions such as the glades or rides between trees in parks or under plantations, where they are for the most part subject to a great amount of shade, and are besides affected by the periodical droppings from the trees, both of the leaves, which act as a manure, and the drip from the branches, which with the shadow instead of sunshine keeps up a continual state of dampness.

Such glades, however broad, are seldom of great value for pasture, for besides the circumstance that the best grasses require the more open parts of the meadow, the drip of trees is decidedly obnoxious to the finer kinds of herbage, as all must have observed; even in meadows much crowded by tall hedge-rows with high trees, and near clumps of trees, the grasses are mostly of a poor description.

If we look at the list of grasses which are the most common in green glades, we shall be enabled to divide them into two groups as follows:

a. Good grasses.
Lolium perenne—Sparsely distributed.
Dactylis glomerata—Usually in tufts.
Poa pratensis.................. }
Festuca ovina .... } Mixed in matted turf.
b. Poor grasses.
Poa nemoralis .... }
Bromus erectus........ } Mixed in the turf in limestone districts.
Arrhenatherum avenaceum—In more or less large bunches.

The first four species are such as commonly occur in tolerably good pastures. Though the sheep's-fescue (F. ovina) is perhaps partial to uplands, yet its other choice is beneath trees, where, if by itself, it always observes the tuft or jungle mode of growth.

The *Poa nemoralis* in the second division is worthy of note in laying down permanent pasture in glades, as it is a finer kind of grass, and so does well to mix with the coarser to fill up—a matter of some consequence in glades, as, from the absence of sunlight, grasses are comparatively shy in flowering, and so the hay crop is always light and scanty, from the absence of flowering culms.

6. *Covert.*—Of grasses peculiar to such a position our list of native species is exceedingly small, including indeed only two:

Bromus asper, and
Brachypodium sylvaticum.

Of these the first is a tall grass, which produces a quantity of tolerably weighty seeds. The second is short; but its seeds, like the former, are no unimportant matter, as, from their size, they are much relished by pheasants; so that these forms are to be encouraged, as the taller one and the shorter, growing as they do together, form not only a high but a close jungle, of great importance in such a position.

Another grass common to wood is the *Aira-cæspitosa*, but this is only present in swampy places. Within the last few years a most magnificent grass has been cultivated in this country, in the *Gynerium argenteum*—the pampas grass—which grows several feet high. This has been highly extolled for covert, and if it can become naturalized in our woods, it will indeed shelter game better than even underwood, but we advise the sportsman to be wary of its flags crossing his naked hands or face, for they have such fine hard serrated edges that they make wounds which are most painful and difficult to heal.

7. *Lawn Grasses.*—Even to the practical agriculturist the patches of lawn and park turf, which is nowhere so fresh and green and smooth as in Old England, are not uninviting. For such positions, species which possess the following qualifications are especially adapted:

Fineness of herbage, as opposed to roughness and coarseness.
Capabilities of well mixing, to form an equable matted turf.
A constitution to bear repeated clippings or cuttings without dying out.

All grasses or other plants that grow separately or bunchy are to be discouraged; indeed, in perfect lawn, plants, other than grasses—as plantains, daisies, and buttercups—are to be especially rooted out.

If with these requisites we can procure species that delight in poverty, so much the better, and certainly the following list is such as will bear great vicissitudes in this respect, namely

Lolium perenne }
Poa pratensis } smaller in poor than rich soils.
Festuca ovina
,, ,, var dariuscula
Cynosurus cristatus — Very small with constant clipping

Why grasses which can bear poverty should be chosen will be evident, when we consider the constant drain there is upon the soil in the oft-repeated mowings to which turf must be subject, where it is at all kept in proper order.

As regards the keeping of lawn in good condition, we may here be permitted to say that an important requisite is that of very frequent mowing in the growing months of the year, as otherwise it runs to culms and flower, which, if permitted, weakens the turf more than any amount of cuttings of the young grasses, as usually the roots of the flowering culms will either die at once, or be just those that will be preyed upon in the winter. If, however, repeated cutting is found to weaken too much, both the colour and permanency of the turf may be greatly advantaged by a winter sowing over it of a mixture of guano and soot well pulverized together, in the proportion of one part of guano to five of soot. In this, besides the manurial influence, the soot is especially serviceable in destroying insects and worms, which greatly injure lawns.

These remarks are equally applicable to lawn which may be required for the manly and thoroughly English game of cricket, as to that for ornament; but with both we would seriously urge the great advantages of using the improved mowing machines, which have now been brought to such a high pitch of perfection. Lawns are not mown so frequently as they should be, on account of the usually uneven appearance and loss of colour which scythe-mowing imparts, to say nothing of the cost for the time which this takes to do it ordinarily well. Now we last year used on our own lawn a capitally made machine by the Messrs. Samuelson, of Banbury, which is so nicely made in all its parts, and consequently works so smoothly, that we find it admirably performs the following duties, all at one operation—namely,

Cuts the grass with the utmost precision and regularity.
Collects the clippings, so that sweeping, which usually takes as long as mowing, is not required.
Rolls it into a perfectly smooth, even, and firm sward.

These operations, which take place as the machine is pushed over the surface, are performed simultaneously, and can be better done on a dry than on a wet day, so that there is no need to disturb the family at 4 o'clock in the morning "to catch the dew," as is so necessary with the comparatively lengthy process as performed by the scythe. For large lawns of course a horse-machine is employed; and we can only say, from having watched them in action, we are convinced of their immense saving in time, in money, and in the advantages derived from improved appearance.

We have now, so far, completed a description of the peculiarities of position of such grasses as are of interest in an agricultural point of view, or such as usually form part of our hay crop in the various kinds of pastures referred to, as well as those which add to our luxury and convenience in various ways, and in so doing we have left out particular mention of such species as, in so far as the present argument is concerned, may be considered as merely curious or only of interest to the botanical student. Again, we have treated those in meadow without reference to any other plants which may be intermixed with them; of these, however, there are several, most of which are only to be considered of the nature of weeds; while a few really add to the value and bulk of the pasture, whether for grazing or for hay: of such are the clovers, as being in themselves highly nutritious; these will be considered at length in their particular positions in the so-called "artificial" grass crop. But there are some plants other than grasses in pasture, and especially in upland districts, which seem to impart a special medicinal, or at least flavouring effect to the green herbage, as to the hay—some probably acting as stimulants, and so assisting in the process of digestion, as *Achillea millefolia* and *A. ptarmica*, and the common thyme; and others doubtless act as astringents, such as the Gentians, of which the *G. amarella* is very common on upland limestone pastures, the tormentil, and others. We have indeed reason to believe that meadows often present in the plants mixed with the grass decided and very opposite medicinal qualities, as we know some pastures in which "scouring" is sure to happen to a greater or less extent to any cattle placed in it; whilst others possess the opposite qualities, which thus become curative to the former; but it is not our object to enter more fully into the interesting subject just now; but we shall in our next paper consider the weeds in pasture.

THE KŒCHLIN METHOD FOR THE EARLY PRODUCTION OF THE BEET-ROOT PLANT.

[TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE."]

Along with great agricultural improvements, such as drainage, subsoiling, deep tillage, the employment of calcareous dressings, artificial manures, &c., &c., whose influence is felt in a general manner on the fields which have received them, there exist other improvements, the more special effects of which bear only upon one species of production, but are not of less importance, since, equally with the first, they tend to hasten the true end of agriculture—the increase of the net produce.

It is in this class that we may range the method proposed by M. Rodolph Kœchlin, a farmer at Hombourg (Haut Rhin), to obtain early beetroot plants, by which to give that plant more time to develop itself.

The Kœchlin method is not, properly speaking, an invention, but the application to the beetroot of processes employed long since with other vegetables.

In 1830, M. Kœchlin, who cultivates weeded plants * (sarclées), asked why, of all those which we commonly transplant, the beetroot was the only one that was not raised upon a seed-bed. Whilst the cabbage, celery, lettuce, and a thousand other horticultural or semi-horticultural plants sown under glass at the end of winter, may be transplanted in the first fine days and have the whole season to develop themselves, the beetroot alone, raised in the open field, and sown after the disappearance of the frosts, is only ready to be planted out by the middle, and often towards the end of June, at the moment when the heat and drought render the drawing, transplanting, and revival of the plant much more difficult, and at which the part of the season most favourable to vegetation has already passed. Seeing no plausible reason for this exception, M. Kœchlin made an experiment. He sowed some seed on a seed-bed towards the end of January, covered it with a frame, and planted them out in March. The result of this attempt surpassed his hopes; he obtained a crop double that obtained from the common method. From that moment he adopted the process into his practice, and has uniformly had reason to congratulate himself upon it.

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* This is a French term for root and other plants requiring repeated hoeing.

Notwithstanding his success, M. Kœchlin found few imitators. They considered it rather an absurd idea to appropriate to plants on a large scale hotbeds and glass frames, and were frightened at the number of these it would require to raise plants enough for many acres of land. Still, his method was adopted by a few of his neighbours, and especially by MM. André and Irvan Kœchlin, his relatives, who were able to appreciate all its advantages. M. André Kœchlin, after having tried the plan many years, sought to extend it, and spoke of it to M. le Comte de Gasparin. The experiments set on foot by that eminent agriculturist fully confirmed those made in Alsace. Yet, as this process involved some expense and attention more than the ordinary method, the number of imitators of M. Kœchlin did not very much increase. At that period we were still under the influence of that proverb, now happily forgotten, "that in agriculture, the first money gained is that whichhas not been expended."

This method, praised by some and cried down by others, is on the whole but little known, and consequently badly appreciated. We think, however, that the readers of the "Journal of Practical Agriculture" will thank us for acquainting them with the details. They can thus make the experiment, and convince themselves, by their own efforts, of its merits or demerits.

At the commencement, MM. Kœchlin sowed at the end of January on a hotbed, and transplanted towards the middle of March. In order to economize the surface of the beds and the number of frames employed, and perhaps also to shew the excellence of their method in producing enormous roots, they planted the seedlings at 60 centimetres (about 22 inches) distance each way, so that they required per hectare only 26,000 or 27,000 plants (about 10,800 per acre), which they obtained from a bed of from 22 to 27 square yards. This system presented many inconveniences. It required the employment of a large quantity of dung, produced plants too watery, and consequently too delicate, and yielded many hollow beetroots—that plant being liable to this defect when it attains an enormous size.

After ten or twelve years' experience, M. Irvan Kœchlin determined therefore to modify his process in the following manner. Towards the middle of February he placed, either in the garden or in the fields, but always in a warm and sheltered spot, if possible by a wall, frames 39 inches wide, made of four boards of pine wood. As to their length, it varies according to the number of plants wanted. The frames being fixed, M. Kœchlin dug and carefully pulverized the earth within it, and watered it plentifully with liquid manure. He surrounded the frames with hot horse-dung, and then tracing with a garden-line small furrows very close to each other, sowed in them the grains one by one, and covered them over with the rake. At intervals he nailed across the frames laths to support mats, which economically supplied the place of glass sashes, and protected very effectually the plants from frost.

In the first days of April the plants generally reached the size of the little finger, or at least that of a good-sized quill, and were quite ready to transplant, which may be done even in spite of a drought, for having attained that size they always strike. In this manner they obtained plants much more hardy, only they required more space than by the old method, since they become larger. In other respects this consideration is of little importance, the expense of the frames being insignificant. We should add that the less thick the seed is sown on the beds the better it will be; for the roots remaining about two weeks longer in the fields than by the ordinary mode are liable to run to seed, and nothing predisposes them more to this than too thick sowing. For the same reason we advise the cultivators never to use seed less than two or three years old.

M. Kœchlin prepares his land in the same manner as the English farmers are accustomed to do for sowing their turnips and ruta-bagas. After having got the soil into a perfect state by tillage, harrowing, and rolling, he forms, with the plough, ridges from 18 to 22 inches wide, according to the richness and the nature of the soil, and spreads his dung in the trench; he then covers the manure by splitting the ridges, and finishes by levelling the tops with the roller. The land being thus prepared, he transplants the beetroot upon the crest of the ridges, placing them at 30 to 40 centimetres, or from 12 to 15 inches, distance from each other. For this purpose he uses a dibble with four wooden points, in order to accelerate the work.

On this plan it will be seen that it requires from 40,000 to 60,000 plants to furnish a hectare (or from 16,000 to 24,000 per acre). The beetroots thus obtained are less in size but more regular, and in the aggregate yield a greater product. When the plants have struck, they pass between the rows with the horseshoe, after which they give them two or three weedings, according to the nature of the soil. After the last weeding, they lightly earth-up the plants.

MM. Kœchlin consider it very important not to dress the plants by cutting the ends of the leaves before transplanting. According to them, it occasions a loss of time to the plant, which receives much nourishment by the leaves. Left untouched, on the contrary, they increase rapidly, soon cover the ground, hinder the production, and above all the development of injurious plants, and retain in the soil a freshness which contributes greatly to the growth of the roots.

Whatever precautions are taken, it cannot prevent a certain number of roots running to seed. They meet this evil by cutting off the stems with a reaping hook. We should observe here that this inconvenience, which is a real one, is generally less so than we take it at first sight. The stalks of beetroot make a great show in the field, and one is always tempted to believe that the proportion of those that run to seed is more considerable than it really is; in counting them they will be found of less importance than may be imagined.

The returns obtained by the Kœchlin plan are extremely high. In a good soil it will produce from 80,000 to 90,000 kilogrammes per hectare (or from 32 to 36 tons per acre) on an average, when strongly manured. M. Kœchlin is said to have obtained from 120,000 even to 150,000 kilogrammes (or from 48 to 60 tons per acre).

This agriculturist recommends cutting the leaves some time before pulling the roots, the wounds having thus time to cicatrize. We have successfully employed another method, which we request those of our readers who have a careful shepherd to try: it is to have them eaten off by sheep. If the shepherd watches his flock attentively, they will not require the roots, or at most will only make very superficial wounds, which will heal over at once, and not at all affect their preservation.

M. Kœchlin cultivates only the globe beetroot. By planting on manured ridges, the long kinds become forked, produce many rootlets, are cleaned with difficulty, and consequently involve a more expensive transport, and are worse preserved. He prefers to all other kinds the yellow globe.

After what we have said, the advantages of the Kœchlin method will be easily understood. Remaining in the ground seven months, instead of four and a half, the beetroots become not only larger but also richer in saccharine and nutritive principles. They cover the ground early, sustain its freshness, and prevent injurious herbs from gaining a head, so that the weeding is more easily effected. In short, they leave, if necessary, the land free at an early period to sow wheat, and allow the distillers and sugar manufacturers to commence operations sooner.

It is evident, on the other hand, that if they take a larger growth, they borrow also from the soil a greater proportion of manure; nor can we trust too much to the advantage the cultivators possess for manuring the land to the maximum required by this method, which does not fear the rain, and which returns always in proportion with the manure that it has received. It will therefore be advantageous in the generality of cases, when we can have only a limited quantity of manure to dispose of, to complete the dose by the addition of some artificial manure. We advise for beetroots the employment of phosphates such as bonedust, the residue of glue manufactories, the bi-phosphate of lime, and even the ashes in preference to very azotous manures, which facilitate the development of leaves rather than that of roots. In all cases where there is a deficiency of manure it is always more advantageous to concentrate it upon a small surface, than to spread it over a great number of acres. We shall thus spare great expenses of rent, of hand-labour, &c., and at the same time obtain a produce quite as large.

M. Irvan Kœchlin, in storing his beetroots, dug in a dry soil large pits, which he lined with boards, as well to hinder the caving in of the earth as to avoid its contact with the roots. He also covered them over with boards, and laid over the whole a coating of turf, which sufficed to preserve the beetroots from the reach of frost.

We have said enough to induce the farmers to try the Kœchlin plan, which, thanks to the modifications to which it has been subjected, no longer presents any difficulty. Doctor Guyot's straw matting will render a real service here.

F. DE GUAITA.

PARLINGTON TENANT FARMERS' SHEEP SHOW.

The annual sheep show of the Parlington Tenant Farmers' Club, belonging to the estates of Lord Ashtown, and F. C. T. Gascoigne, Esq., Parlington Hall, was held April the 13th, in a field adjoining Hicklam House, the residence of the respected agent, Mr. T. J. Fox, whose liberality on the occasion in providing a luncheon for the numerous guests was duly appreciated. One great drawback, however, to the pleasures of the day was the continued severe illness of Mrs. Fox, who always takes the liveliest interest in the welfare and happiness of the tenanty. The committee were fortunate in securing the services of the following eminent agriculturists to officiate as Judges: W. Torr, Esq., Aylesby House, Lincolnshire; F. Jordan, Esq., Eastbourne, Driffield; H. Nicholson, Esq., Givendale, Ripon. Their awards were as follows:—

Class first, for the best pen of ten fat hoggs in their wool, to be drawn from the regular flock of feeding hoggs, first prize of £3, Mr. J. Rishforth, Lotherton; second, of £2, Mr. S. Rishforth, Coldhill. Other exhibitors in this class: Mr. B. Nicholson, Sturton Grange; B. Atkins, Esq., Mansion House; W. Atkinson, Esq., Barrowby; Mr. T. Simpson, Park House; Mr. Forcet, Peckfield; and Mr. G. Smart, Hoodhouse Grange.

Class second, for the best pen of ten fat hoggs bred upon the estate, first prize £3, Mr. Brady Nicholson, Sturton Grange; second, £1, Mr. Forcet, Peckfield. Other exhibitors: Messrs. Woodward, Thurkill, and Smart.

Class third, for the best pen of ten gimmer hoggs bred upon the estate, first prize of £3, Mr. G. Smart, Woodhouse Grange; second, £1, Mr. Woodward, Huddleston Hall. Other exhibiters, Messrs. Rishforth and Nicholson.

Class fourth, for the best pen of five ewes with single lambs, first prize, Mr. J. Furniss, Stank House. Other exhibitors, Messrs. Atkinson, Nicholson, and Rishforth.

Class fifth, given by T. Perkins, Esq., of York, for the best pen of five ewes with double lambs, first prize, Mr. Simpson, Parkhouse. Messrs. Atkinson, Furniss, and Rishforth exhibited.

The prizes for clipping were won by the shepherd of Mr. Smart, and Abraham Dickinson, the labourer of Mr. Nicholson.

The hoggs exhibited in Class first were highly creditable, and I doubt not, taking age into consideration (under 13 months), whether they can be excelled by the tenant farmers, or any one nobleman's or gentleman's property in England. It must be borne in mind that many of the hoggs in this class had been bought lambs in the autumn, with a view to winning the prize, one gentleman having selected one hundred of the tops out of four hundred! Other selections were made at the autumn fairs of York, Ripley, Malton, and St. Boswells. The hoggs of Mr. Nicholson were all bred by himself, by rams of his own. As proof of the excellence of the hoggs, they were sold out of their wool, in Leeds and Wakefield markets, at the following prices: Mr. J. Rishforth's first prize-pen realized 70s., Mr. S. Rishforth's second prize 66s., Mr. B. Nicholson's 75s., Mr. Forcet's 66s., B. Atkinson, Esq.'s 66s., Mr. Simpson's 63s., Mr. Smart's 55s.; Mr. W. Atkinson's unsold. The hoggs shown in class second, bred upon the estate, made Mr. Nicholson's 71s.; Mr. Forcet's 70s. 6d., Mr. Thurkill's 63s., Mr. Woodward's 56s. Mr. Smart's 55s. The gimmer hoggs of Mr. Smart were descended from rams of Mr. Leighton, of Osgoldly, near Scarborough, from whose rams Mr. Jordan's prize Smithfield gold-medal wethers were bred.

The show being over, a large party of gentlemen adjourned to the White Swan, Aberford, where a good dinner was provided by the landlady, Mrs. Dawson. The wine was most handsomely given for the entertainment by the Rt. Hon. Lord Ashton. The speeches of Mr. Torr and other gentlemen, upon the breeding, feeding, and management of sheep, were very practical; and much information was gathered from the various speakers. The conclusion arrived at respecting the sheep best adapted for the estate was—a strong Leicester, or a cross between the Leicester ram and Lincoln ewe.

Ten years ago, scarcely any sheep were kept upon the property, the soil being a strong limestone; but owing to the zeal of the able and active agent, Mr. Fox, in conjunction with the skill, energy, and enterprize of the tenantry, this wonderful change has been brought to pass, and there is not a more improved estate in Yorkshire—improvements brought about by the liberal expenditure of oil-cake to the stock and artificial manure applied for the growth of the turnip.

SPECTATOR.

PLEURO-PNEUMONIA IN CATTLE AS IT HAS RECENTLY SHOWN ITSELF IN AMERICA.

By C. M. Wood, V.S., Boston, Massachusetts, U. S.

Early in October, 1859, I learned that Winthrop W. Chenery, Esq., one of the merchant-princes of this city, and a resident in the town of Belmont (seven miles distant), had lost a large number of his stock by a disease which nobody appeared to understand. On the 26th of that month, I met and spoke to Mr. Chenery upon the subject, when he not only corroborated what I had previously heard, but also informed me that he had lost twenty-four head of valuable cattle, of various ages, and many of them imported at great cost. He likewise stated that one of a yoke of working oxen was then sick with the same distemper, and he feared it would die. Further, that he still had a number of valuable animals, which he thought would be likely to take the disease, and he should be pleased to find some person who understood the nature of the malady, so as either to cure it or arrest its further progress. He added that Dr. George H. Dadd, of this city, had visited and administered medicine to many of the cattle, but that nearly every case had proved fatal. Dr. Dadd said that he had never before seen anything of the kind; but from the description he had read of it, he believed it to be a disease of Continental Europe, called "pleuro-pneumonia," and that medical treatment was of no use whatever, as the disease was always fatal.

One of my professional brethren. Dr. William Saunders, of Salem, in this State, a man of extensive practice amongst neat cattle, being present, we agreed to visit the sick ox that afternoon. On arriving at the barn or cowhouse (which I will hereafter describe), we found the animal lying in a box or pen. He was eight years old, of the Devon breed, and exhibited the following symptoms: Countenance dejected, eyes sunken in their orbits; pulse 70, small and wiry; respiration laboured, rumination and appetite lost, bowels constipated, breath offensive. He sighed heavily as he lay; and when urged to rise gave a loud grunt, and when up moved reluctantly and with much apparent difficulty. His body was emaciated, his hair standing on end, his skin adhered to his ribs, he drank but little, and when food was offered averted his head, as if hardly conscious of his own existence.

On examination of the chest, it was evident that there was consolidation of the lungs. I informed the owner that there was no chance of the animal's recovery, when he said that he wished him to be destroyed at once. He was forthwith led from the stable, and with great difficulty taken to a field some forty or fifty rods distant, and there knocked on the head. He had been sick about two weeks.

Post-mortem Examination.—On opening the abdominal parietes, all the viscera were found to be healthy except the liver, which presented a dirty-yellow hue, was quite soft, and when broken down exhibited a kind of disintegrated, coarse, granulated, degenerated mass. The diaphragm, on its abdominal surface, was healthy; on its anterior or thoracic surface it was ulcerated throughout. The chest contained several gallons of a straw-coloured fluid. The lungs presented an extraordinary appearance, being at least three times their usual size, of a dark brown colour, almost black, and when cut into they were nearly solid in their whole substance, except a small part of their anterior or bronchial portions, in which softening had commenced, while their inferior presented, when cut, a chequered appearance, of a dark yellow cast, but they were evidently tuberculated throughout their whole substance, and they adhered firmly to the walls of the chest. There was, however, a thick, tough, yellow lymph, of nearly an inch in substance, intervening between the pleura pulmonalis and the pleura costalis.

My employer seemed well pleased with my diagnosis, and also my demonstration, and promised me that of the next case which presented itself I should be immediately notified.

Accordingly, on the 14th of November, I was informed of the sickness of two animals—one a three years old Devon heifer, the other a four months old female, pure-bred Ayrshire calf. I immediately repaired to the spot, where I met Dr. E. F. Thayer. Upon examination, the following symptoms were presented: Pulse quick, and oppressed; respiration hurried, and accompanied by a sigh during inspiration, and a grunt in expiration; the visible mucous surfaces highly injected; rumination suspended; appetite much impaired; bowels unusually constipated, the fæces being granular. There was, on pressure of the intercostal spaces, extreme soreness evinced, particularly in the calf, with also a staring of the hair and a tightness of the skin.

I ordered a gentle aperient to be given of infusion of thoroughwort (*Eupatorium perfoliatum*), a remedy very highly valued in this country in the treatment of cattle, as a cathartic, with pulv. zingib. and molasses. Plugged their dewlaps with garget root (*Phytolacca decandra*)—another Yankee remedy—and ordered warm drinks and a moderate diet.

November 15.—The bowels of both are responding to the medicine, otherwise there is but little change in either. Gave tonics combined with stimulants, in small doses, three times a day, interposing an occasional aperient, as above described, and continued this treatment till the 29th, when I pronounced them both rapidly recovering.

The heifer was, however, the subject of a malignant disease (carcinoma) in the right eye, which had destroyed the sight, and also turned the eye out of its orbit, and likewise obstructed the nasal passage on that side. As there was no hope of her recovery from this disease, the owner wished her destroyed. This was deferred to a fair day, the weather now being very cold, and also to enable me to notify Drs. Saunders and Thayer to be present.

On Friday, Dec. 2, Mr. Chenery called to inform me that the mammoth cow, "Lady Washington," was sick with the distemper, and wished me to visit her immediately. I went accordingly, accompanied by Dr. Saunders; and meeting with Dr Thayer there, I examined the animal, which I will now describe. She was six years old, of the pure Durham breed, and measured as follows: From the occiput to the tuberosity of the ischium, nine feet; girth around the brisket, eight feet eight inches; height, five feet four inches (sixteen hands), and weighed 3,260lbs. She gave birth to a calf two days before. She had, as I was informed, been delicate in her feeding since the Sunday previous.

On the morning after calving, the following drench was given her—

Infusion of thoroughwort, 2 pints;
Sulph. magnesia, 8 ounces;
Pulv. zingib., 1 ounce;
Molasses, 4 ounces.

Upon examination, the following symptoms were presented: Pulse rapid and oppressed, the artery having a peculiar vibrating or double action under the finger. Respirations, 36; sighing during inspiration, grunting on expiration. There was also a kind of subsultus, or spasmodic twitching of the involuntary muscles about the chest. The rumination had ceased; the appetite was lost; she drank but little; the visible mucous surfaces were slightly injected, and a morbid insensibility of the spinal column existed about its connection with the diaphragm. She coughed occasionally, lay down frequently, and rose up without any unusual effort. On the left side percussion was very dull, and also on the right, below the median line, above which a vibratory sound was most distinctly heard. The left lung was evidently consolidated, and the right partially so.

Treatment.—The bowels having responded to the medicine before given, I plugged the dewlap on both sides with the *Phytolacca decandra,* and gave tonic and stimulating agents combined, under the conviction that, as torpidity and debility seemed to be the leading features in the disease, this mode of treatment was fairly indicated. I ordered her to be kept warm, to have warm drinks given her, and a little food of any kind that she would eat.

It being now a fine day, and Drs. Saunders and Thayer present, we destroyed the Devon heifer, which, upon examination, showed no trace of the acute disease for which she had so recently been treated. The abdominal viscera were healthy, except the liver, upon the anterior superior surface of which was a small abcess, about the size of an English walnut. The heart was healthy; the lungs also, with the exception of a small portion of the left lung, about five inches in length and four in breadth, which at the extreme inferior margin was consolidated, and, strange to say, it had the appearance of a band having been placed around it between the healthy and the diseased parts. It was hanging pendulous, as if about to slough away from the healthy portions. She had exhibited no symptoms of disease for a week previous to her being destroyed. She ruminated, ate, drank well, took her rest regular, the excretions were healthy, and spirits good, and, to all appearance, she had fully recovered from the recent attack of the disease, being killed only on account of the cancer in the orbit.

Dec. 3rd.—I visited the mammoth cow. Symptoms the same as yesterday. She drinks a little gruel, but eats nothing; lies down and rises without difficulty. The sighing, grunting, and twitching of the muscles of the chest still continue. The countenance is expressive of extensive disease; surface of the body cold; extremities, legs, ears, and horns warm and cold at intervals.

Treatment.—I inserted two setons, of about ten inches in length, of Professor Morton's medicated tape, on each side, which were dressed occasionally, and renewed when needed; and at the urgent request of Dr. Thayer, several applications of the cantharides liniment were made over the setons, but it produced little action. The vital force seemed concentrated within the body, and the skin had become cold and insensible to the stimulating effects of the blister, and,indeed, even the setons were very tardy in their operation, and hardly effectual.

As this communication must necessarily be lengthy, I will be as brief as possible as to treatment. Suffice it to say, that it consisted of tonics and stimulants, given for about three weeks, the bowels all this time remaining healthy, when diarrhœa set in, which was succeeded by rapid prostration. I now ordered one pint of wheat flour and one of oatmeal, made into gruel, one-half to be given that evening, and the remainder the following morning. From this time she was disposed to constipation, and required aperient medicines, one in three or four days at the longest. A quart of infusion of thoroughwort always gave relief.

She continued in this way, occasionally rallying for a few hours, only to sink lower in the scale of health, until January 9th a.m., when she died, after five-and-a-half weeks' illness, with but little variation of symptoms from the first to the last. Nor did she during all this time eat a sufficiency of food to have supported her one day when in health.

As I had informed my employer at first that this animal was suffering from latent disease of the lungs (as the sequel will show), he was desirous that I should demonstrate my diagnosis by an autopsy of the animal.

Again accompanied by Dr. Saunders, I went to Belmont, where we met Dr. Thayer.

Post-mortem Examination, seven hours after death. The stomach and intestines were healthy, and they contained very little ingesta; the kidneys and bladder were also healthy, the latter was empty. The liver was pale and of a yellow hue, enlarged in size, flaccid, and appeared to contain a quantity of a semi-fluid or grayish matter. On opening the thorax, the lungs were found to present a mass of disease, and the anterior and inferior portions of the right lung were so firmly adherent to the pleura costalis that it required a stout man to break down the adhesions. These organs, when placed on the ground, were viewed with astonishment for their bulk, and were supposed by those present to weigh at least sixty pounds. Their anterior portions were solid, with tuberculous deposit, quite hard to cut. In other parts a similar condition was observable, but not to so great an extent. They contained no blood, when cut scarcely staining the knife. The pleura costalis was healthy, except the adhesions just mentioned. When completely eviscerated, the abdominal cavity of this large animal seemed capacious enough to accommodate a small family.

I would here state, that by the side of the animal just examined lay an imported Dutch cow, which had died the night previous. She was imported in 1857, and had been sick since last June. On my first visit, October 26th, my attention was called to this cow. She was then standing by the side of another Dutch cow, which was imported in 1855. The former of these two was with calf by a celebrated Dutch bull, and the owner was desirous to keep her, if possible, until March next, her time of calving; but she was another victim to this tuberculous disease. On examination of this cow, the lungs were found to be a broken-down mass of disease, and adhering to the pleura costalis throughout their whole surface. They were almost black in colour, and in the anterior and inferior portion of the right lung there was a large cavity, which had doubtless existed for a very long period, as it contained much offensive, streaky, black-and-green pus. The liver also presented extensive disease. The intestines too were discoloured. This, however, may I think be attributed to the animal's lying for twenty-four hours after death before examination. The one spoken of as standing by her side is still living, and well.

During my visits to the mammoth cow my attention was called to an aged cow, of the Durham breed, which my informant told me was as severely attacked as any he had seen among the herd. On examination she exhibited the same symptoms as those I have before described, viz., the quick, small pulse; injected mucous surfaces; quick and laboured respiration; tight skin; staring coat; sunken eye; constipated bowels; loss of appetite; the same sighing and grunting; the surface of the body and extremities cold; rumination and appetite suspended.

I had the animal warmly covered, gave a diffusible stimulant, inserted setons in the chest on both sides, and ordered her to be supplied with warm drinks. On the following day I gave a gentle aperient, which was followed by tonics and stimulants. In a few days she was convalescent, and is now apparently well.

I was informed that she had before exhibited slight symptoms of the disease, and had mustard poultices applied to her sides, which were supposed to have checked its progress for a time. This cow is the only surviving one of five which were purchased in the State of New York, and had never been housed until brought to this place.

I will now proceed to give a brief history of the disease from its commencement, together with a description of the stable or cowhouse in which the animals were kept.

The owner informs me that in the spring of 1859 he imported, from the north of Holland, four cows. They were shipped at Rotterdam on the 6th of April, and arrived in Boston on the 23rd of May. Two of these cows were in bad condition at that time, supposed to be from neglect on the voyage. They were transported from this city to the Highland farm in Belmont, seven miles distant, in waggons, being unable to walk. One of their number died on the 31st, eight days after its arrival, and a second on the 2nd of June.

Presuming that the only disease of these animals was prostration, induced by injuries or neglect on shipboard, the symptoms were not noticed, only that they had diarrhœa, and that their evacuations were exceedingly offensive.

About the middle of June a third animal of this importation was observed to feed but little in the pasture, and to absent herself from the rest of the herd, appearing dull and dejected. These symptoms were succeeded by a hard, dry cough, ears cold and drooping, grinding of the teeth, short breathing, rapid loss of flesh and strength, and as the disease progressed, the breathing became more laboured, the animal making a sort of grunt at every respiration, and a fetid secretion took place from eyes, mouth, and nostrils. The respiration became more and more difficult, until in the last stage, when she stood with her nose elevated almost on a line with her back, and her mouth open, and thus she died, on the 29th of June, thirty-seven days after her arrival.

The next one was an imported cow from Holland in 1852, consequently she was fully acclimated. She dropped a calf on the 2nd of August, about two weeks before her time, was taken sick on the 10th, and died on the 20th of the same month. Her calf is still living, and apparently in health, except that it has disease in the joints of the extremities. Under the influence of the iod. potass. externally and internally, it is improving.

During this month (August) an ox and a calf showed slight symptoms of the disease, but not an entire loss of appetite, and they both recovered.

About September 1st five or six animals were taken in the same manner, and in quick succession several others. During this month and the early part of October there were from five to ten sick all the time, and nearly all these cases proved fatal, twenty-four having died, and only eight, which were very slightly attacked, recovered. The average time an animal lived after the attack was about two weeks. In two or three cases they became tympanitic before death, and in one instance, of a two-year-old heifer, the animal died in three hours after she was discovered to be ill. Strange as it may appear, no animal of the whole herd has died of this disease except those kept in the cowhouse, but the first two which died of the last importation, and they were not put there. Suppose a building standing on a hill-side, and commanding one of the most extensive prospects of any farm-barn in the state. You would think it in one of the most healthy locations. The cowhouse is fifty feet square inside; height from floor to ceiling, eight feet; with a cellar under the whole, for the purpose of making manure, having numerous small openings or scuttles in the floor for the purpose of passing down the excretions. These scuttles, having no hinges, would frequently tilt up and fall through upon the manure below, thus allowing the gases to ascend into the cowhouse. This, together with a badly ventilated place, with the cattle, forty-two in number, of all ages, standing nose to nose, I think you will admit was a sufficient cause for a disease of the character we have been describing, particularly when I again say to you that not a single head of cattle has died (except three out of four, imported in May last) which had not been kept the previous winter in that cowhouse. The mammoth cow was bred in the State of Vermont, and was brought to market for beef, but Mr. Chenery was unwilling that such an extraordinary animal should be slaughtered, and he therefore bought her for breeding purposes. She was kept in the cowhouse from the middle of February, 1859, until the 1st of April, when she was removed a short distance into the shed, from twenty-five to thirty feet square, high, dry, and well-ventilated. Nor was she after leaving the cowhouse ever in contact with any other animals on the place, but was kept in the shed; nor was she ever out of it during her life, except once by accident, and then she did not come in contact with any other animal.

However strongly disposed I might be to call this disease infectious, I have equally strong reasons for believing the contrary. During the early part of the summer Mr. Chenery had in pasture, several miles distant from his farm, six young cattle, which were born in the spring of 1858. He had also three other young cattle, which were born in the fall of 1858; these three were kept in a pasture about eighty rods from the barn or cowhouse. He had also two calves from imported stock, born in this cowhouse in the spring of 1859. In July, when old enough to put to grass, they were first pastured with the three nearest home; then the five remained together about four weeks, when they were all removed to the pasture, several miles distant, with the six older abovenamed. The eleven were here kept together several weeks, when one of the two youngest which were taken from the cowhouse, and which had been exposed to its contaminating influence, was discovered dead in the pasture, and the other was very sick. The dead one was immediately buried, and the sick one taken home, where it died in two days afterwards. But the nine which had not been exposed to the atmosphere of the cowhouse have continued well up to this time. I should state that one of the youngest of these nine animals was supposed to be sick in December last, after their return from the pasture, when the person in charge gave to it a single dose of the Yankee remedy, thoroughwort tea, which immediately restored it to its wonted health. And notwithstanding they were exposed for weeks with the two which died, they are now all well.

I would now again observe, that although there was slight diarrhœa in the large cow, upon the whole she was constipated, requiring aperients even up to the time of her death.

Remarks.—Many persons in this vicinity have heard of the loss of this most valuable stock of cattle, and doubtless they are interested to know the cause.

There are various opinions in relation to it, both among veterinarians and others. Although there are some facts which would lead many to think that the disease originated with the cows imported in May last, still there are many circumstances equally as strong which will lead to a different conclusion. I believe they died of phthisis pulmonalis, a disease resembling "consumption" in the human subject. We have given a brief description of the building in which the cattle were housed, and we think it probable that the last importation might have contracted the disease of which they died on shipboard. Although they came from Holland, in many parts of which it is said there are a great number of diseased cattle, and they might have brought from thence the germ of that disease with them, yet one of their number is still living and is well. We think, further, that we have discovered another cause of the death of so many valuable animals, viz., the building or cowhouse itself, with the practice of securing the animals with their heads towards each other; for thus each healthy animal was forced to inhale the breath of the diseased; and it is a fact that the healthy were the companions of the sick until the latter died and were removed.

Unhealthy air, expired by the sick and inhaled by the healthy, will often generate a general malady; and, admitting any constitutional predisposition to exist in the animals, such contact must produce disease. The breath from putrid lungs cannot be inhaled with impunity. The cattle of which we are writing breathed into each other's faces. Disease in the respiratory organs of the healthy was thus generated by the expirations, exhalations, and excretions of the sick. And if there was an insufficiency of pure air admitted into the building to counteract the deleterious "miasma," we have a sufficient and reasonable cause for the loss which has been sustained.

I would further remark, that much of the external air admitted into the cowhouse came from the cellar beneath it, by the frequent opening of the scuttles for the removal of the execretions of the animals; this coming in upon their rear, and not in their front. Thus the foul air was near their nostrils, and because it was foul it impeded the admission of fresh air from the windows in the cowhouse, which probably were kept too frequently closed.

I suppose that a current of fresh air from above will rest upon a stratum of foul air below, if the specific gravity of the last be greater. And it must be greater because it is charged with the moisture of the fermentation of the manure below, and the excretions of the animals within. I would here observe, that in regard to ventilation, the owner was extremely desirous to secure pure air in the cowhouse, and in the building of it impressed as much as possible on the minds of the mechanics its necessity. He had from twelve to fourteen windows on the east, south, and west sides, and also an opening in the roof, and the bottoms of the windows were about four feet from the floor. Hence a difficulty, as I have before described, in properly ventilating the building. Again, as the owner only visited the animals for about an hour each day, and that in the afternoon, he was not present at the closing or opening of the cowhouse, consequently he could not know the mode of ventilation, or if any existed.

Since his loss, the owner has had the cowhouse thoroughly cleansed and purified, and its ventilation improved by openings made through the walls, upon the surface of the floor, and by a funnel introducing pure air from without through a large grating in its centre, by which means pure air is now diffused over the whole floor, the foul escaping from a large ventilator through the roof, since which all sickness has entirely disappeared.

The whole number of cattle lost is twenty-seven. —Veterinarian.

SOIL: ITS EXHAUSTION.

The general exhaustion of the soil is often referred to by agricultural writers; and while we freely admit that districts may be exhausted for current purposes, still it is perfectly evident, upon a thorough examination of nature's laws, so far as now understood, that the general fertility of the world at large cannot be materially lessened as a whole, and as the advancing education renders practical operators more intimate with science (for in their hands alone can science materially assist agriculture), the amount of vegetable, and consequently of animal product, will be materially increased.

As to sectional exhaustion, it may be thus viewed: Take, as an example, the Atlantic slope of the United States. The soil contains an inexhaustible amount of the primaries which go to make up the entire constituents of plants, by the availing of atmospheric assistance; but these primaries exist in different conditions; that portion which has occupied organic life, and has been redeposited in the soil by the decay of organisms, is fitted for assimilation and the production of current crops. This we shall denominate the *progressed pabulum.* The other portion, or the *unprogressed,* represented by 95 per cent. of the dry weight of the surface-soil and a still greater portion of the subsoil, is incompetent at this time to form part of any organism, except the lichens, mosses, &c., such as originally seized from the rocks, or their debris, what now constitutes the progressed pabulum of the surface-soil. Thus it may be seen that the whole soil may in time and in turn form part of organic life; but that class of organisms now developed, and the means adopted for its production, will be in use over and over again, and form the progressed pabulum already existent. It will be borne in mind that no portion of this first class ever passes out of existence, although it may change locality by the removal of crops or of animals fed upon those crops. Thus bones and potash exported from the United States, or undergoing a change of locality within the United States, must denude the portion of soil producing them of phosphate of lime and potash, at least so far as the extent of the progressed portion forming these materials; and it is this removal, in the form of crops and otherwise, which has so denuded the Atlantic slope, of phosphates, potash, &c. Indeed, we find the same truths already applicable to some of the Western States, and the reduction of the agreable crop of wheat clearly demonstrates this fact. It is equally certain, however, as we shall presently show, that other portions of the globe must in turn be rendered more fertile by the restoration of these materials to the soil elsewhere, and we claim that from natural causes they must find their way back for re-appropriation.

Thus it will be seen that the more industriously cultivated portions of the globe may, under the style of tillage which has been pursued in many countries, lessen in their powers of production; but it is not so clearly established that other portions are not progressed in consequence.

As to the second class, or that portion of the primaries forming a large per-centage of the surface-soil, and a still larger of the subsoil, it has been erroneously looked at by scientific men as having no difference in value with the progressed pabulum; and the only admission which has been freely made by all, as to its greater adaptability, has referred exclusively to those portions in such proximate conditions as are recognized by the word *organic.* All the sixty-four primaries of nature are to be found in this second or unprogressed class; and as they find their way to the surface, or as the atmosphere is admitted to percolate more deeply into the soil, they undergo chemical changes which prepare them to commence their routine of action in the second class, and thus in turn they must eventually, *i. e.* in all time, go to form organisms, first of lower classes, and gradually, by decay of these, those of a higher order. If this were not true, the continued disturbance and fallow condition of soils, without the use of fertilizing materials, could not render them fertile, as we continually find to be the case.

But what does become of the results of plants and animals which go to form the food of man, and which decay in the various ways which the wants of man suggest? All admit that the organic portions, or those which were originally received from the atmosphere, are restored to it, whatever may be the means of consuming the crops, while the inorganic portions are either returned to the soil from natural causes readily understood, and reproduce themselves in new form, or find their way through creeks, rivers, &c., to the ocean, which becomes the receptacle of immense amounts of decayed organism, until at this date every gallon of ocean water has an excess of weight, as compared with the water of our springs. This excess is principally of progressed inorganic matter, capable, under certain circumstances, of being restored to the soil, as we shall presently exemplify. But the portion which does not reach the ocean may be thus viewed—one example will suffice for all:—

Whether the vegetable be consumed as animal food, burnt, suffered to decay by rotting, or be fermented, as in the manufacture of alcohol, beer, &c., still all components are restored to the soil in a district sufficiently large to receive the results within its area; millions of cords of wood might be burnt at its centre, and all the results of that combustion would simply go to increase the weight of the current growing crops. We cannot send forth into the atmospheric ocean, during a growing season, any of the organic portions which will not be re-assimilated at an early date; the dews and rains acting as the cleansing agents of the atmosphere, bring them to soil where the roots of plants immediately receive and re-produce them in organic form. The inorganic portions, being in a condition to be readily assimilated, are more slowly, but with the same certainty, re-appropriated.

The bones of the United States, until within a few years, have principally been exported to England, and while the wheat crop has sunk from thirty or thirty-five bushels to the acre to an average of eleven, that of England has increased from eleven to twenty-eight. The earlier advancement of the manufacturing arts in England has called for the potash lixiviated from the ashes of our forests, and this in turn, after being used by the manufacturers, has found its way to the farms, and is still doing so to an extent that tends to denude other countries of progressed potash, and to give it place in English crops.

To the extent that we can keep the results of inorganic decay, such as are consequent upon home consumption, within our own country, we shall put off the date for this partial exhaustion, and therefore the time when large districts must again remain in a quiescent state, to recuperate by nature's laws, will be deferred. There are but two ways in which soils, said to be worn out—which simply means that all the progressed pabulum it contains, or at least a large portion of it, has been removed in the form of crops—can be restored; firstly, by the importation of progressed pabulum from elsewhere, and its addition to the soil; and secondly, by the adoption of such means as will progress the primaries and proximates contained in that soil, to a status or condition that will render them fit to form new organisms. Each of these in degree can be availed of at the same time; and thus farmers who under-drain, subsoil-plough, and furnish to the soil fertilising materials from elsewhere, even in minute quantities, may raise green crops; the introduction of which into the soil, in addition to the progressed pabulum imported, will cause new portions of the primaries to be liberated from their prison-houses (the grains of sand composing that soil), and in new proximate conditions, so that the soil is again restored.

This still further procrastinates sterility; but if at any time the soil be denuded of progressed constituents, it may be called sterile, and for all practical purposes to the present generation it must remain so, as without the means we have indicated the operations of nature's laws, by atmospheric influence, are too slow to furnish from the soil itself, by progression, the necessary constituents in proper condition for the protection of plant-life.

Now, let us examine the course of such pabulum as has found, and is continually finding its way to the ocean. The Mississippi sends into the Atlantic, daily, progressed pabulum resulting from the decay of organic life, through the Mississippi valley and other valleys and streams which empty into the Mississippi, an amount which would be competent to fertilize a county. The La-Plata, the Rio-Grande, and all the rivers of the Gulf, and indeed all rivers, are, in degree, sending their portions to the ocean. These constituents are the same as would result from the burning of these crops, and would be found in their ashes. All the large cities send by their sewerage the real value of all they consume to the ocean, and there nature's laws seem to be active for the carrying back to the soil all these very ingredients. The algæ thrown upon the coast go to fertilize farms in their vicinity; the fish taken from the ocean and consumed by man restore to the soil much of the salts of lime, and, indeed, of the nitrogenous portions which have been previously given up by plants; the shells of shell-fish contribute largely to the restoration of progressed lime; oils consumed in lamps and brought from the ocean furnish many of the compounds found in plant-life. Their combustion simply throws these proximates into the atmosphere, whence the dews and rains restore them to the soil.

The sea-fowl deposits in its excretia, on the continent, the food which it consumes on the ocean, and the immense deposits of guano at the Chincha Islands, the aggregations of centuries, are now being carried to enrich continents; and when we see the immense amount collected on so small an area, and know that, in degree at least, a large portion of the earth's surface has been more gradually receiving similar deposits from birds, some idea may be had of how much is restored to the land from the ocean by these means.

But the restoration from the ocean to the land does not cease here: the upheavals in nature bring back trillions of tons of valuable matter for re-assimilation. Take any one of the primaries, and trace it through its various ramifications in the ocean, and this fact may be clearly illustrated thus: all the lime resulting from the decay of crops on the continents, and which in solution is passing into the ocean, may go to form the shells of shell-fish and the bones of fishes, millions of times before the coral insect takes it to build his habitation. Those mountains of coral imbedded in the ocean are occasionally, by upheaval, constituted portions of the soil; and one ton of this coral, after having undergone the changes consequent upon again meeting with the atmosphere for a sufficient time, is worth an untold amount of lime in a more primitive condition for agricultural purposes.

We find in many parts of the world soils containing forty per cent. of decomposed coral (carbonate of lime), and still these soils are fertile; but if we add two per cent. of carbonate of lime, made by burning the primitive limestone and exposing it to the atmosphere until it becomes carbonate, we will render those soils sterile for a long period; and in the absence of greater knowledge than we now possess, we must adopt the hypothesis that the carbonate of lime arising from the coral has functions not possessed by that consequent upon the manipulation of the limestone, and that these functions are the records of its progression, from having been so frequently in organic life before.

From the foregoing, we think it is clear that the ocean and the land are reciprocating continuously, merely assisting each other in following nature's grand effort—progression; that new portions of primary matter are continually being progressed, probably in the ratio of the increase of population, and that the probable effect to be looked for is a greater amount of organic life.

Nature never makes mistakes, and while we see the race of man increasing, it is more than probable that his necessities will be supplied by the same laws which created him.—The Working Farmer.

THE ALPACAS IN AUSTRALIA.

On the 29th of November Mr. Ledger started from Liverpool with the flock of alpacas and llamas, and proceeded with them along the Southern Road. Their destination is a reserve contiguous to the township of Nimity Bell, in the Maneroo district, situated between Bombala and Cooma, and about two hundred and sixty miles from Sydney. The locality is that recommended by Mr. Ledger upon his return from his tour of inspection, as the most suitable for the settlement of the animals, the pasturage being well watered by the Snowy River, and the mountainous character of the country allowing of the removal of the flock whenever a change of temperature should be thought desirable. Mr. Ledger is still upon his journey, which, with the view of ensuring the safety of the animals, is divided into short stages. Some of the settlers along the road traversed have promised the use of their paddocks for the alpacas, and also hospitable entertainment to Mr. Ledger and his South American shepherds, while on their journey, the enterprise being regarded as of great importance as well as of interest, by those who have realized wealth from pastoral occupations. Some, however, who would willingly have rendered this assistance to Mr. Ledger, had the flock remained in his possession, are disposed, now that they are the property of the Government, to charge the full price for the accommodation.

The process of shearing was in operation at the date of our last summary. As many of the females, both llamas and alpacas, were in lamb, it was not thought advisable to shear them just before starting. Only about two hundred animals therefore were shorn; the wool produced is about six cwt. The fleeces are of three kinds—those obtained from pure alpacas, those from llamas, and those from hybrids between the two breeds. It is intended, we believe, to ship the wool to England, to be sold at the London wool sales, when due notice will no doubt be taken of the sale of the first shipment of our new—perhaps, in future, our staple—export, as well as of the fact of its being the first importation of alpaca wool into England that has ever taken place from any country, except Peru or Bolivia, the occasional receipt from other ports in South America being merely trans-shipments of cargoes from those countries. As the entire flock were shorn, either just before embarking, or directly after landing, the wool is essentially the produce of Australia, and will give an assurance to the English manufacturers of the yearly augmenting quantities which they may expect from this colony. We understand that samples of the wool are being forwarded by this mail to the Manchester Chamber of Commerce and to other mercantile companies, who are likely to regard with interest the gradual development of this new branch of producing industry, and to appreciate duly its importance in relation to British commerce.

The alpaca fleeces are characterised by the length and fineness of the fibre. These qualities are particularly noticeable in the lambs born in the colony, which Mr. Ledger asserts to surpass any he has ever seen in Peru of the same age. The fact is highly satisfactory as proving the adaptation of the climate and pasturage of Australia to their development, and as insuring the ultimate success of the undertaking. One important feature in the fleeces of alpaca wool is the entire absence of the yolk, or grease, the presence of which diminishes so much the commercial value of the staple of this colony.

Now that the experiment of introducing the alpaca into Australia has been fairly tested, it is thought desirable by those who have throughout taken an interest in the enterprise, that a testimonial should be offered to Mr. Ledger for his costly, hazardous, and most valuable service to the colony. It will be remembered that the sum of £15,000, which the Government paid for the purchase of the flock, was accepted under composition by the agent of the firm who furnished Mr. Ledger with the means of pursuing his enterprise when his own resources failed, and that Mr. Ledger did not touch one farthing of the money. In his undertaking Mr. Ledger sank the whole of his own fortune, amounting to about £7,000, and was therefore, on arriving in this colony, a ruined man. His reception here being very different from what he had been led to expect, and involving the disappointment of all his cherished hopes of remuneration, he recently memorialised the Government, urging his equitable claim on them for the amount he had expended, referring to the distinct assurances of remuneration which were held out by the Government six years ago, and stating that in the event of his claim not being recognised he must resign his appointment in connection with the alpacas, as his own interests and those of his family in South America would be sacrificed by remaining in this colony. Mr. Ledger's claim was refused by the Government, who stated they considered the transaction settled by their predecessors, but undertook to increase his salary, as superintendent of alpacas, from £300 to £500 per annum. Although Mr. Ledger has throughout displayed an earnest and patriotic interest in the successful propagation of the alpaca in these colonies, he naturally feels that he has sacrificed sufficient in its accomplishment, and is anxious to return to South America, where his former career and his numerous friends would command for him a position of which he does not see any prospect in this colony. He has accordingly definitely resigned his appointment after locating the animals in Maneroo, but has offered to instruct any party who may be appointed by the Government to succeed him in the management of the flock, and also the shepherds, as the Peruvians who came over with him cannot be induced to remain after his departure, although Mr. Ledger has used every effort to persuade them to do so. It was, under these circumstances, thought the time was a fitting one for the public to be invited to present a testimonial to Mr. Ledger, and accordingly a meeting was convened a few days ago. The attendance, though small, was influential, being presided over by Sir Charles Nicholson, and it was unanimously determined to open a public subscription, and also to communicate with the Government, urging that Mr. Ledger's salary should be increased to £750 per annum. A letter was read at the meeting from Mr. T. S. Mort, who was unable to attend, pointing out the high prospective value of Mr. Ledger's enterprise, and bearing testimony to the promises of recompence which were made him in 1853 if he should succeed in landing a large flock of Alpacas in Sydney; a subscription of a hundred guineas was promised by Mr. Mort to the testimonial. A list of the sums collected will shortly be published, and it is hoped that, for the credit of the colony, the high merit of Mr. Ledger, in opening up a new source of productive industry, will be properly appreciated. By many persons the opinion is expressed that Mr. Ledger's recompence should be at the hands of Government rather than depend upon public liberality, and it is understood that the Ministry are prepared to support any reasonable proposition to that effect if introduced by a private member. It would indeed be a disgrace to the country if Mr. Ledger, after so far successfully completing his zealous and hazardous enterprise, commenced on the faith of promises of handsome remuneration, should be allowed to depart to South America, and relate there—what would quickly be circulated in other countries—that an enterprise which had been highly extolled in England as likely to open a new era in British commerce, had been unrequited by the country which would chiefly benefit by it, and whose Government had, after promising him ample reward if he succeeded in the enterprise, cruelly disappointed him.

In support of the claim which Mr. Ledger has upon the colony, it may be desirable to refer to the former failure of attempts to introduce alpacas here, owing to the prohibitory laws of the Peruvian Government, and to the effect which Mr. Ledger's successful evasion of those laws has produced. A correspondent of Mr. Ledger's, connected with the leading families in Peru, and well informed on political matters, writes—"You have so wounded the pride of Peru and Bolivia, that, in order to depreciate the value of your enterprise, and to prevent your obtaining remuneration from it, the Peruvian authorities contemplate removing the restriction on the exportation of alpacas." If this intention should be carried out, it is not impossible that we may in the course of a few years receive other flocks of these animals, as they could on the removal of the restriction be introduced at a comparatively small cost. The propagation of the animals and the production of the wool in Australia would thereby be more rapidly brought about, and Mr. Ledger's claim on the gratitude of the colonists more firmly established.

AYRSHIRE AGRICULTURAL ASSOCIATION.

This great meeting, which came off at Ayr, on Monday and Tuesday, April 23 and 24, is regarded by the agricultural community in the West of Scotland with a great and increasing feeling of interest. The observation and experience of each successive year deepen the farmer's conviction of the importance of consuming the grass and provender of the farm with the description of stock which gives most milk or lays on most meat, in proportion to the amount of food eaten by the animal; and the advantage is equally evident of cultivating the land and preparing the produce of the farm for food with implements and machines which can be worked with speed, economy, and efficiency. The amount of capital employed in agriculture is still generally far too small. In the well-managed districts, however, it has been much increased during the last ten years; and where the outlay is large, it is not difficult to perceive that the farmer's profit depends to a considerable extent on the quality of his stock and the efficiency of his implements, as well as upon active and judicious general management.

The following gentlemen acted as Judges:

Ayrshire Dairy Stock.—Mr. John Baird, Lochwood, by Coatbridge; Mr. Patrick Graham Barnes, Limekilns, East Kilbride; Mr. Alex. Buchanan, Garscadden Mains, New Kilpatrick.

Horses.—Mr. Robert Wilson, Frithfield, by Anstruther, Fife; Mr. Robert Clark, Hamilton; Mr. James Salmon, Benstone, Johnstone; Mr. John Fulton, veterinary surgeon, Ayr.

Blackfaced and Cheviot Sheep.—Mr. Robert M'Turk, Hastingshall, Minnyhive; Mr. James P. Willison, Dalpeddar, Sanquhar.

Shorthorned Cattle; Leicester, Southdown, Crossbred Sheep; and Pigs.—Mr. Thomas Lawrie, Terregleston, Dumfries: Mr. Alexander Young, Keir, Bridge of Allan.

Fat Stock.—Mr. Arbuckle, Kilmarnock, and Mr. David M'Culloch, Auchness, Stranraer.

DAIRY STOCK—AYRSHIRE BREED.

For the best bull, not under three years old, Eight Sovereigns, with one sovereign additional if a pedigree of the prize animal be produced, for not less than two generations back, and the Society's Silver Medal to the breeder; Ivie Campbell, Dalgig, New Cumnock.

For the second best, four sovereigns; John Parker, Nether Broomlands, Irvine.

For the third best, two sovereigns; Matthew Hamilton, Newfield, Mains, Dundonald.

For the best two-year-old Bull, five sovereigns, with an additional sovereign for the pedigree, and the Medal to the Breeder, as above; John Parker, Nether Broomlands.

For the second best, two sovereigns; Robert Dunlop, Auldton, Dreghorn.

For the third best, one sovereign; Wm. Guthrie, Knockshiffnock, Ochiltree.

For the best bull stirk, two sovereigns, with an additional half a sovereign for the pedigree, as above; John Parker, Nether Broomlands.

For the second best, one sovereign; William Kirkwood, Shanketon, Straiton.

For the third best, half a sovereign; John Parker, Nether Broomlands.

For the best aged cow, in milk or in calf on the day of exhibition, ten sovereigns, with an additional sovereign for the pedigree, and the medal to the breeder, as above; James Wilson, Oldmill, New Cumnock.

For the second best, five sovereigns; James Wilson, Oldmill.

For the third best, two sovereigns; W. & J. Knox, Kilbirnie.

For the fourth best, one sovereign; Wm. Lang, of Groatholm, Kilwinning.

For the best aged cow, in calf on the day of exhibition, three sovereigns, with an additional sovereign for the pedigree, and the medal to the breeder, as above; John Parker, Nether Broomlands.

For the second best, two sovereigns; R. S. Muir, Marshyland, Beith.

For the best lot of three aged cows, bred by the exhibitor, in calf or in milk on the day of exhibition, six sovereigns; Andrew Aiton, Craigend, Dundonald.

For the second best, three sovereigns, John Ritchie, Broadwood, Coylton.

For the best five aged cows, the property of exhibitors, being owners or occupants of lands, or being resident in one parish, ten sovereigns, William Lang, of Groatholm, Kilwinning.

For the best three-year-old cow, in calf or in milk on the day of exhibition, six sovereigns, with an additional sovereign for the pedigree, and the medal to the breeder, as above, Thomas Campbell, Yonderton, Kirkmichael.

For the second best, three sovereigns, Peter Connar, Barclaugh, Coylton.

For the third best, one sovereign, Henry M. Cuningham, Carskeoch, Patna.

For the best pair of two-year-old queys, not in calf, two sovereigns, John Parker, Neither Broomlands, Irvine.

For the second best, one sovereign, George Richmond, Burnton, Dalrymple.

For the third best, half a sovereign, Alexander Oswald, Auchencruive.

For the best pair of quey stirks, two sovereigns, John Parker, Nether Broomlands.

For the second best, one sovereign, Hugh Williamson, Outmains, Tarbolton.

For the third best, half a sovereign, James Reid, Mid Sanquhar.

DAIRY STOCK—SHORTHORNED BREED.

For the best bull, not exceeding five years old, three sovereigns, James Campbell of Craigie.

For the second best, two sovereigns, Quintin Bone, Greenan, Maybole.

For the best one-year-old bull, two sovereigns, William Wright, Woodland, Girvan.

For the second best, one sovereign, John Hamilton, Monktonhill, Monkton.

FAT STOCK.

For the best ox or heifer, pure or cross, calved after 1st January, 1857, three sovereigns, Bryce Wright, Dowhill, Girvan.

For the second best, one sovereign, Bryce Wright, Dowhill.

For the best, calved after 1st January, 1858, three sovereigns, Alexander Blain, Alton Albany, Girvan.

For the second best, one sovereign, Alexander Blain, Alton Albany.

For the best fat cow, of any age, of the Ayrshire breed, two sovereigns, Charles Wilson, Jameston, Kirkoswald.

For the second best, one sovereign, John Findlay, Lyonstone, Maybold.

HORSES.

For the best brood mare for agricultural purposes, having had a foal in the season of 1860, or being in foal at the time of the exhibition, five sovereigns, John Craig, Drumshang, Maybole.

For the second best, three sovereigns, Wm. Kirkwood, Shankston, Straiton.

For the third best, two sovereigns, Wm. Kirkwood, Shankston.

For the fourth best, one sovereign, Andrew Allan, Clevance, Dundonald.

For the best gelding or mare for agricultural purposes, four years old and upwards, three sovereigns, Robert Dunlop, Magbiehill, Stewarton.

For the second best, two sovereigns, John Stevenson, Merryhagan, Kilwinning.

For the third best, one sovereign, Matthew Kerr, Gree, Beith.

For the best three-year-old, two sovereigns, James Findlay. Langlands, Kilbirnie.

For the second best, one sovereign, Wm. Love, Scoup, Beith.

For the third best, half a sovereign, George Scott, Barr, Largs.

For the best gelding or filly for agricultural purposes, foaled after 1st January, 1858, two sovereigns, David Kerr, Haining, Largs.

For the second best, one sovereign, Wm. Reid, Clune, St. Quivox.

For the best colt, foaled after 1st January, 1859, one sovereign, John Anderson, Gass, Straiton.

For the second best, half a sovereign, Alex. Anderson, Guiltreehill, Kirkmichael.

For the best filly, foaled after 1st January, 1859, one sovereign, Wm. Kirkwood, Shankston, Straiton.

For the second best, half a sovereign, James Osborne, Shiel, Stair.

For the best pair of agricultural geldings or mares, three sovereigns, John Dick, Doonholm, Ayr.

For the second best, two sovereigns, Robert Hutchison, Craiksland, Dundonald.

Por the third best, one sovereign, John M'Colm, Crawfordston, Tarbolton.

For the best entire colt, foaled after 1st January, 1858, five sovereigns, Daniel Crawford, Warrenhill, Dalry.

For the second best, three sovereigns, Alexander Wilson, Lugton Inn, Beith.

For the third best, one sovereign, Matthew Young, Knockendale, Symington.

SHEEP.—Blackfaced Breed.

For the best two aged tups, selected from a sheep stock of not less than 80, two sovereigns, James Craig, Polquheys, Cumnock.

For the second best, one sovereign, H. F. Kennedy, of Finnart, Glenapp.

For the best two-year-old tups, selected as above, two sovereigns, Alexander Blain, Alton Albany, Girvan.

For the second best, one sovereign, James Findlay, Langlands, Kilbirnie.

For the best three tup hoggs, selected as above, two sovereigns, James Craig, Polquheys, Cumnock.

For the second best, one sovereign, James Craig, Polquheys.

For the best pen of five ewe hoggs, selected as above, two sovereigns, Alexander Lennox, North Balloch, Barr.

For the second best, one sovereign, James Fergusson, Auchensoul, Barr.

Cheviot Breed.

For the best pen of five ewe hoggs, two sovereigns, Thomas M'Millan, Chaughue, Barr.

For the second best, one sovereign, John Marshal, High Mains of Dalquharran, Dailly.

Leicester Breed.

For the best tup, two years old and upwards, three sovereigns, Alexander Ralston, Lagg, Maybole.

For the second best, one sovereign and a-half, Adam Rankin, Knockdon, Maybole.

For the best under two years old, two sovereigns, Adam Rankin, Knockdon.

For the second best, one sovereign, Adam Rankin, Knockdon.

For the best three ewes, not exceeding five years old, with their lambs, or being in lamb on the day of exhibition, three sovereigns, David Gray, Barmuirhill, Tarbolton.

For the second best, one sovereign, Robert Inglis, Stair House, Stair.

Southdown Breed.

For the best tup, two sovereigns, Adam Rankin, Knockdon,

For the best three ewes, not exceeding five years old, with their lambs, or being in lamb on the day of exhibition, two sovereigns, James Campbell, Craigie.

Crosses.

For the best pen of five wedder or ewe hoggs, a cross betwixt the Cheviot and Leicester, one sovereign, Andrew Ralston, Lagg, Maybole.

For the second best, half a sovereign, John M'Lymont, Balsaggart, Maybole.

For the best pen of five wedder or ewe hoggs, a cross betwixt the blackfaced and Leicester, one sovereign, John Rankin, of Beoch, Maybole.

For the second best, half a sovereign, Adam Rankine, of Knockdon, Maybole.

For the best pen of five wedder or ewe hoggs of any of the above crosses, one sovereign, John Rankine, of Beoch, Maybole.

For the best pen of three lambs of any breed, dropped not earlier than 1st January 1860, one sovereign, Adam Rankine, Knockdon, Maybole.

HIGHLAND SOCIETY'S EXHIBITION OF LEICESTER SHEEP.

Tup of any age, belonging to a proprietor or factor, the Society's silver medal, Alexander Ralston, Lagg, Maybole.

Best tup of any age, belonging to a tenant, five sovereigns, Adam Rankin, Knockdon, Maybole.

For the best two-shearling tups, five sovereigns, Adam Rankin, Knockdon.

For the best pair of five gimmers or shearling ewes, four sovereigns, Adam Rankin, Knockdon.

PIGS.

For the best boar of any breed, four sovereigns, Robert Drummond, Bogwood, Mauchline.

For the second best, two sovereigns, John Ritchie, Broadwood, Coylton.

For the best breeding sow of any large breed, having reared a litter within two months of the day of exhibition, two sovereigns, Robert Drummond, Bogwood, Mauchline.

For the second best, one sovereign, John Muir, Knowside, Maybole.

For the best of any small breed, two sovereigns, David Gray, Barmuirhill, Tarbolton.

For the second best, one sovereign, Quintin Dykes, Monkton.

For the best breeding sow of any large breed, in pig on the day of exhibition, two sovereigns, Robert Paton, Trees, Ayr.

For the second best, one sovereign, Thomas Lindsay, Townend, Craigie.

For the best of any small breed, two sovereigns, John Craig, Drumshang, Maybole.

LONDON, OR CENTRAL FARMERS' CLUB.

WHEAT-GROWING ON THE LOIS-WEEDON SYSTEM.

The usual monthly meeting of the Club was held in New Bridge-street, on the evening of Monday, May 7th, L. A. Coussmaker, Esq., of Westwood, in the chair. There were also present Messrs. N. G. Barthropp, John Thomas (Bletsoe), H. Trethewy, W. Fisher Hobbs, J. Tyler, C. Howard, James Thomas, T. F. Wilson, J. Robinson, E. Little, R. Bond, T. Owen, J. A. Williams, S. Skelton, G. Smythies, T. Congreve, J. G. King, J. B. Spearing, R. Goldhawk, S. Sidney, P. H. Frere, J. Goodwin, J. C. Morton, C. J. Brickwell, J. Whaley, J. Hooker, E. Purser, G. S. Harrison, J. Parkinson, J. Odams, W. Butcher, R. Holmes, R. Dunkin, W. Greene, &c., &c.

The **Chairman** observed that the subject appointed for discussion that evening was a rather novel one. Some persons present might not have heard much about the Lois-Weedon system of growing wheat; and still more, might never have seen it practically carried out. At their last meeting the committee received from the Rev. Mr. Smith, of Lois-Weedon, an invitation for a deputation from the Club, to visit his farm, and see his system of wheat cultivation in operation, so as to have their minds informed with regard to it before the subject was discussed. Accordingly a deputation went down, of which he himself formed part, and he could assure the meeting, that they were most hospitably received by Mr. Smith.* As regarded his system, that gentleman courted inquiries, and did not seek to evade answering any questions that were put to him. They all saw his system in operation, and certainly as far as it went, and as far as the time of year would allow, nothing could be better. After seeing everything, and hearing all the explanations which were given, however, they came to the conclusion, that although the system, if carried out on a small scale, would answer; if it were carried out on a large scale, serious doubts might fairly be entertained as to the result. He did not himself see how with that system they were to obtain a sufficient amount of labour at the particular time when it was most required. That, however, was a point on which the members would form their own judgment. He was sorry to say that Mr. J. A. Clarke, of Long Sutton, Lincoln, who undertook to introduce the subject, was prevented from attending, by illness; but he had entrusted his paper to Mr. Corbet, to read, and after the experience which they had two months ago, he need scarcely say that no man could do more ample justice to it (cheers).

Mr. **Corbet** said that he felt his first duty would be to read the following letter, which he had that morning received from Mr. Clarke:—"My dear sir,—I should much like to have been present on Monday, but I am sure the excitement of meeting the members on the occasion would be too much for my strength at present, and would probably throw me back in health for several weeks; and as the only assistance I am able to give would be the answering of a few questions (for solving doubts and replying to objections, either theoretical or practical, would be too exciting a task for me in the present half-restored state of my brain), I thought it the part of prudence to stay away altogether. As I was ill when I undertook to introduce the subject, I hope the Club will not deem me guilty of neglect of duty. Any points requiring elucidation, in reference to my own experiment, I shall be able to set right in an after-letter to the *Mark Lane Express*. It was very kind of you to offer to fulfil the task of reading the paper, and I have no doubt that you will do it much more effectively than I could have done.—I am, dear sir, yours very truly, John Algernon Clarke, Long Sutton, Lincolnshire, May 5, 1860.—H. Corbet, Esq." Mr. Corbet added, that the "reply" promised would, of course, appear in the *Journal* of the Club. He then read Mr. Clarke's paper, which was as follows:—

Mr. Chairman, and Gentlemen,—Though I am to bring before you on this occasion some extraordinary results of the mechanical tillage of soil, I have no wish to disparage the equally important art of manuring; and while I hope to show the advantage of growing wheat in annual succession on the same field, I shall not dispute the importance of a judicious rotation of cropping, or the value of alternate husbandry. My purpose is simply to describe in a few words (1) what is being done at Lois-Weedon, (2) what has been accomplished in other instances, and (3) what are the results and deductions from my own experience; and I shall then offer (4) a brief explanation of the principles on which Lois-Weedon wheat-growing is founded. The importance of the subject is of course fully recognized and felt by the Farmers' Club; and, therefore, I need not dwell upon the necessity for some means of augmenting our yield and diminishing expenditure, now that prices are so unpromising, rents and public burdens so heavy and threatening, while guano is becoming so scarce and dear, and the tantalizing town sewage still flowing to waste. Happily, however, the new power of cultivating by the steam-engine has been given to us just as the productiveness of mechanical tillage is being demonstrated on a great scale, and at a time when the expensiveness of manual labour, and the defective as well as costly character of horse-power culture, are being generally acknowledged. So that if "wheat-growing on the Lois-Weedon system" should be found advisable, we shall certainly have ample means for carrying it into practice, whether by steam or horse-power.

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* The deputation consisted of Mr. Coussmaker, as Chairman, Mr. Owen Wallis, Mr. John Thomas, Mr. William Shaw, Mr. Spencer Skelton, Mr. Charles Howard, Mr. W. Gray, and Mr. Henry Corbet, the Secretary. The visit was made on Thursday, April 19; and on the day following the party proceeded to inspect Mr. W. Smith's system of Steam Cultivation at Woolston.

1. The Rev. Samuel Smith, the vicar of Lois Weedon, near Towcester, in Northamptonshire, published his first "Word in Season" ten years ago; he had then thrashed his third successful harvest, and was warranted in expecting that his extraordinary and profitable experience, in spite of low prices, would be tested at once in every part of the kingdom, seeing that farmers were at that time in a condition of distress, and almost despairing of ever being able to grow wheat, or any other crop, remuneratively. But so slow is the progress of a novelty in farm-management, that Mr. Smith has had to plod on, patient and undiscouraged, through all the long seasons of sowing, culture, and harvest, during thirteen tedious years, with a success ever increasing, and falsifying all the forebodings of incredulous individuals, both scientific and practical. And still he finds only a few imitations here and there, and comparatively small interest taken by the agricultural public in the results of his marvellous cultivation. Strange apathy, surely, on our part! because Mr. Smith had nothing to gain by the extension of his mode of husbandry. He reaped a handsome profit himself, and generously invited others to do the same; but it seems that English farmers have not had the boldness to try the plan in its integrity, or the ingenuity to imitate, by horses and implements, a tillage described to them as performed mainly by the spade, which tool of course could never be employed in general business. I trust that the practical members of this Club will bring this discussion to a really practical issue, and not let the year 1860 pass away without sowing, in various districts, a considerable number of experimental pieces of the three-row stripes of wheat. I have inspected the astonishing crops on Mr. Smith's little farm more than once, and did the limits of my subject permit, I could tell of winter beans, *in single rows five feet apart,* branching so as to meet across the intervals, with stalks bearing 40 or 50 pods each, and yielding over six quarters per acre; while in the fallow spaces between were raised eight or nine tons of carrots besides. I could tell of 27 tons per acre of swedes, also grown in single rows 5 feet apart, with their leaves touching across the intervals, and their bulbs flattening each other's sides, though singled with a 12-inch hoe—of prodigious weights of mangold wurzel, and enormous drumhead cabbages 40lbs. in weight, cultivated with the same wide spaces. For the intercultural tillage is indeed a marvellous promoter of the growth of vegetation, the trenching being deep, as well as the manuring heavy, farmyard dung being buried 15 inches below the surface, and artificials plentifully supplied. And latterly Mr. Smith has placed the manure along the middle of the fallow intervals, 2½ feet from the rows of plants which are to profit by it when they have matured their growth, and spread out their network of root-fibres like spider's webs for some feet on all sides. But our business is with the wheat crops, which are not manured, for the simple reason that they are quite heavy enough to stand their ground as it is; though both corn and straw are abstracted every year without any manurial return. A somewhat unexpected circumstance this, that wheat will answer the call of judicious deep and surface tillage without asking for guano or nitrate, or even the "good old stuff;" while beans, and roots, and green crops want, and will respond handsomely to, any amount of both tillage and manuring. Perhaps a hint may be drawn from this by managers of labourers' allotments. Mr. Smith's land is just what his publications have told you it is: one field is the ordinary heavy wheat soil of the oolite formation, generally rented at not more than 30s. an acre; the four acres of lighter soil have chiefly a gravelly subsoil. The same qualities of land exist over tens of thousands of acres; and, undoubtedly, any tolerably fair wheat land may be brought by the same means to a similarly fertile condition. I said that the wheat land has not been manured; but the light piece has had a moderate dressing of clay, because this contains in abundance, and is able to acquire in abundance, the pabulum on which the wheat plants feed. This dressing was not expensive, and has lasted well for a good many years. Many people feared that when Mr. Smith ceased to deepen his staple his crops would cease to flourish; in fact, that he was exhausting the goodness of each additional inch of subsoil as fast as it was brought into play by the trenching-tool. What is the fact? On the light land dressed with clay the fork has never penetrated below 13 inches, yet the average yield for nine years is about 34 bushels per acre. The history of the clay piece is as follows: Fifteen years ago it was in grass, which was pared and taken off the land: it was then ploughed the full depth of the 5-inch staple for oats, followed by vetches. After this came the first

triple-rowed wheat, the wide intervals being dug by spade one spit deep, bringing up to the surface only a few inches of yellow clay subsoil. The second year, these well-stirred and horse-hoed intervals bore the three-row stripes of wheat, and the stubble-row stripes were dug in; and so on, fallow intervals and wheat rows succeeding one another alternately. In the third and fourth years the spade went down a little deeper; and so, gradually and regularly for four years more, till a depth of 16 or 18 inches was reached. Mr. Smith then cultivated for the next four years with *only single-spit digging*, and in 1858 again returned to the trenching two spits deep with a fresh inch of clay. Conscious, however, that the spade must always be an implement of limited and expensive use, Mr. Smith has been for some years labouring to improve the digging-machine, or rotary forker, and has now succeeded in his invention of a digger, which, drawn with wire rope by Mr. Fowler's horse-power capstan, or his steam-engine and windlass, perfectly inverts the soil, throwing the uplifted subsoil on the top. Preparatory to working it, the stubble is pared and burnt; then comes the digger, with three subsoil tines on the same frame, going before the digger, and loosening the stubborn soil to the full depth required. The revolving tines raise the whole stratum in spits, which are cast off behind in an inverted posture by a rotating clearer or beater, the breadth taken being 22 inches. As a stirring implement in the summer season its action is perfect. The average annual expenses per acre are—

	£	s.	d.
Digging and cleaning the moiety of each acre ..	1	14	0
Horse-hoeing ditto three times, 6s.; ploughing, 4s.	0	10	0
Hoeing and handweeding..................	0	5	0
Rolling with crusher at seed-time, and at spring 1s.	0	3	0
Two pecks of seed, 2s. 6d.; dibbling, 5s.	0	7	6
Bird-keeping	0	4	0
Earthing-up wheat	0	3	0
Reaping, &c., to thrashing and marketing......	1	13	0
	£4	19	6
Rent—say, £2; rates and taxes, 4s. 3d.	2	4	3
	£7	3	9

To this should be added something for interest, insurance, &c.; so that the total outlay may be taken at £7 10s. per acre. The digging machine will, of course, enable the work to be done much more cheaply. What has been the produce? The average of the first eight years, beginning with the harvest of 1847, was fully 34 bushels per acre; in 1855, the yield was 40 bushels; in 1856, 37 bushels; in 1857, 36 bushels; in 1858, upwards of 40 bushels; and in 1859, the last harvest gave 38 bushels. The general average for the thirteen years is 35½ bushels per acre. The quality of the grain is so good, that Mr. Smith has usually made the highest red wheat price of his market; and this fact is thus accounted for: The straw grows stout and stiff, owing to the free access of air and light from the ear down to the very base of every stem; and just before flowering-time, the rows are lightly earthed-up with the plough mould-board. A good deal of the straw of last year's crop was upwards of 6 feet high, *yet none of it laid;* though all other bulky crops in the neighbourhood (fed by guano or otherwise), were either wholly or partially beaten down and damaged by the rains. The average amount of straw has been about 1½ tons per acre; and must be reckoned as part of the realized produce, because it is never returned to the land. At 40s. per quarter the returns will be

35½ bushels at 5s........	£8	17	6	+ 1½ tons of straw
Deduct outlay	7	10	0	
Clear profit per acre	£1	7	6	+ 1½ tons of straw.

Mr. Smith's straw is worth £2 per ton to him; and consequently, his net proceeds must be £4 7s. 6d. an acre at the present low prices. And when wheat was at 56s. a qr., his net gain was no less than £7 18s. 6d. per acre. But if you choose to put the straw at 10s. a ton, the profit (with wheat at 40s.) is still £2 2s. 6d. an acre. The question now arises, what is the present condition of the land, after this flogging course of cropping, of wheat after wheat thirteen years in succession? Well, the proof is in the produce; the average of the first eight years was fully 34 bushels, but the average of the succeeding five years has been fully 38 bushels—that is, the land yields a coomb an acre more than it did. The light-land field, with its one dressing of clay, continues (at the ninth year of experiment) to maintain its average yield of 34 bushels. Mr. Smith has favourded me with the following letter:—

"April 2nd, 1860.

"Dear Sir,—You ask me for any further information I may have to communicate with reference to my wheat-growing, beyond what I have already made public.

"At the beginning of last winter occurred a curious circumstance, which permits me to go somewhat deeper still into certain details of some importance in elucidating the subject. The circumstance I refer to was the insertion of a letter in the *Mark Lane Express*, which ran thus: 'Sir,—I observed in your paper last week that the Rev. Mr. Smith estimated his wheat crop this year at 35 bushels, at 7s., or £12 5s. per acre. In returning from the Warwick Meeting last July with two friends, we visited Lois Weedon, and we saw the worst crop of wheat I have seen this year. We estimated the produce at 15 bushels per acre; and putting the price at 5s. per bushel, the amount, instead of being £12 5s. will be £3 15s. per acre. As such statements are likely to mislead your numerous readers, by inserting these few lines in the *Mark Lane Express* you will much oblige, your obedient servant, A Hertfordshire Farmer.'

"Now, with regard to the estimate and value which others might have put upon my last year's wheat crop, I have, of course, nothing whatever to do. What I said myself in the last edition of the *Word in Season to the Farmer*, published in November, was this: After repeating what I had stated in the former edition, that I should only report in future on the wheat crops grown on the heavy wheat land—the light land being withdrawn from the public for private experiments—and that the yield for 1858 was upwards of 40 bushels of fine red wheat, I said that '*the crop of the present year* (1859), *not yet thrashed, was exceedingly fine; not merely bulky, and large in the ear, but unusually heavy in the sheaf, and at reaping was estimated at* 40 *bushels at the least.*'

"I replied to the 'Hertfordshire Farmer' as follows:—'It is always a hazardous thing to estimate a crop of wheat before thrashing. I certainly looked this season for more than 40 bushels to the acre; and I did so, not merely because the crop was so bulky and large in the ear, but from the weight of the sheaves at reaping. Unexpectedly tempted, however, by the frost to thrash in the open, I found the actual produce of my three acres to be fourteen quarters two bushels and a-half, being about 38 bushels to the moiety of each acre. I call it *the moiety* of each acre, for so it literally and actually is. For a full acre of wheat in 10-inch rows contains, we will say, 120 rows. Take away, then, every alternate three rows, and you have the Lois-Weedon fallow, and only 60 rows, being the actual moiety of an acre of wheat. I am much indebted to that one day's well-timed frost: for otherwise months might have passed without the means of correcting my own error of ewo bushels too much, and the Hertfordshire Farmer's droll tstimate of three-and-twenty too little.'

"Here, then, is a crop of wheat yielding from its 60 rows at 10 inches apart far beyond the farmer's average from 120 rows 10 inches apart. How could this be? I do not mean, how can a crop of wheat be grown in this way as good as my neighbours' on the same description of land well-manured—for that is the subject of my whole pamphlet on growing wheat, and to repeat it here would be tiresome tautology. The question is—How can it be that this crop of wheat was twice as good as my neighbours'? The secret is simply this: I sow only in September, and thus the plant tillers fully before winter. Now, compare a fully-tillered crop with late-sown wheat which has not tillered at all, or only partially tillered, and you will find that the straw of the former, from the manner of its growth from the coronal root, stands by many degrees closer and thicker on the ground than either of the latter; and in nine seasons out of ten I can save this thick and heavy crop from falling, by earthing it up with a bout of the plough. When it does fall, it lies uninjured and well-ventilated across the open furrows of the intervals. Let the farmer sow early on land in good heart, and his wheat, too, will tiller of course; or let him top-dress at spring with guano or nitrate of soda; and in both cases his crop will exceed mine by a quarter or more of good wheat in his one sunny season out of ten: but the other nine years, down comes the bulky mass, with the old result of mildewed straw and shrivelled grain.

"There is another thing. The wide space of the intervals admits the full force of the sun and the air, and that gives increased health and vigour to the plant; while its roots, spreading far and wide without check, find a never-failing supply of food for the grain, from its first formation in embryo, till it flowers and fully ripens. The general result is, ears far beyond the average size of the wheat ear, filled with at least a fourth part more than the average amount of grains.

"Taking these two facts together, then, we are able to solve the problem how it is that the 60 rows of the Lois-Weedon moiety of an acre of wheat yield as large an average amount of grain as the ordinary farmer's full acre of 120 rows.

"I said just now that for two years my light land crops of wheat have been unreported, and withdrawn from public inspection, in order to be set apart for private experiments. What occurred, however, in my wheat cultivation there last year is so much to the point of the present inquiry, that I think it right not to withhold it on this occasion. When I first took this four-acre piece in hand for wheat, it was exceedingly foul from the accumulated filth of perhaps a century. For nine years I did battle with the weeds with partial success; and in order to shorten, if possible, the road to victory, I made the following experiment: Immediately after the crop of 1858 was carried, I broadshared and stirred the fallow intervals, killing the first growth of weeds, and leaving it for a second weed crop. At the end of a few weeks, I stirred and killed the second growth. I waited another few weeks, and did the same; and so for the last time about the end of November; and then at last got in my wheat, nearly three months after my usual time. The time for safe tillering was now over. The dry winter and spring which followed were much against me; and I could not venture to touch the poor miserable plant till May. I had lost one of my great means of competing in produce with the full-acred farmer: how, then, could I escape almost utter failure? To force those thin and sparse lines to tiller late in the spring would have been to ruin the sample by an uneven and mildewed crop. My only resource, then, was to seize the proper moment between too soon and too late, for pampering the plant, such as it was, with the hoe and the plough; to feed it profusely in this way early and late; giving the last copious meal with the subsoiler, to swell the grain as the flower fell off.

"The process succeeded to the full extent of my hopes; for, I think, of all the crops of wheat I have ever had, this turned out the largest-headed and most even, the ears being more than double the size of my neighbours' on the same description of soil, and grown from much the same sort of seed. The four acres yielded eleven quarters five bushels and a-half, being somewhat under three quarters to the moiety of each acre.

"Very faithfully yours,
"S. SMITH."

"Mr. John Algernon Clarke,
"Long Sutton."

2. Is there some peculiar and marvellous property, then, both in the clays and light lands of Mr. Smith's neighbourhood, giving a miraculous degree of fecundity that cannot be expected elsewhere? No. There are many examples of successive wheat-growing, by means of intercultural tillage, which show its practicability on soils of very diverse qualities, though my space forbids any description of the methods employed. And at the same time, it must be owned that many persons have tried and failed; though I believe, in all cases, either from a misunderstanding of the principles of procedure or inattention to essential details of the management. Mr. Jones, of Lois Weedon, has grown half an acre of wheat on Mr. Smith's system for nine years, the average yield being $36\frac{1}{2}$ bushels per acre, the soil and subsoil a gravelly loam, the gravel predominating. The Rev. Sir George Robinson has grown $4\frac{1}{2}$ acres of wheat for ten or eleven years, with an average yield of $28\frac{1}{2}$ bushels per acre; the soil a mixed sandy clay, and the subsoil a stiff clay, the fallow intervals being dug 8 inches deep by spade or fork. Jethro Tull—whose name should always be received with reverence by an assembly of agriculturists—originated this culture of successive wheat crops upon a thin chalk soil, and performed his tillage by means of a cumbrous plough and "hoe-plough." He had at one time 120 acres of wheat growing on his novel method, and reaped 13 successive crops with yields considerably surpassing those of his neighbours. I regret that more cannot be said in the present limited paper concerning the father of the very subject we are now met to consider; and still more do I regret that there should be a necessity for such a discussion as the present no less than 127 years after the publication of Tull's great discoveries in the science of cultivation. Mr. Dean, a disciple of Tull in the last century, grew on a very stiff soil tilled by the plough a produce of 27 bushels per acre for twenty years in succession. The Rev. F. Close, shortly afterwards, grew on 5 acres of mixed loamy soil 24 bushels per acre for three successive years, also cultivating with the plough. Mr. Beaman grew 23 bushels per acre for six years on a stiff loam resting on marl and clay, the plough being the principal implement of tillage; and Mr. Box, about twenty years ago, grew 27 bushels on one acre for eight years together, upon tolerably good land, by ploughing between the rows. These facts are given in Mr. Burnett's admirable volume (recently published) "On Tillage as a Substitute for Manure." There are also various other cases; some of complete success, others which (either from the manual labour required in the turnip season, or from other difficulties) were ultimately abandoned. I have been favoured with details of the Lois-Weedon wheat-growing of Mr. W. Greene, of Mortivals, Little Canfield, Chelmsford. This gentleman has now 58 acres on this plan; on 7 acres he has obtained three crops, on 7 acres two crops, on 24 acres one crop, and the remainder was put in this last autumn. The land is mostly heavy, with a clay subsoil. The wheat is sown by "Sigma's" dibble in treble rows a foot apart, with three feet intervals. These intervals are dug by hand 2 spits deep, about 3 inches of the subsoil being turned up the first

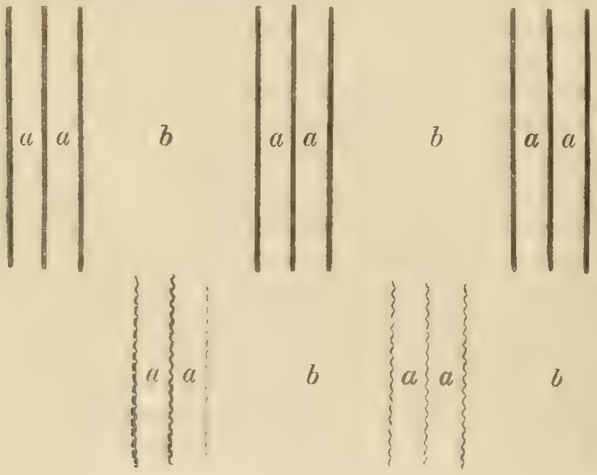
year, the intervals being gradually tilled deeper until a depth of 15 to 18 inches is attained. About twenty men are required to dig the fallow stripes of 58 acres, so as to complete the work in seasonable time, the cost being 28s. to 30s. per acre. A light forking is needed in the spring, at 5s. per acre; and two or three scarifyings, to keep the surface open—these being executed by a lad and a one-horse implement. The total cost for labour, allowing 3s. a day for a horse, is about £4 10s. per acre, including harvesting. The first field of 7 acres, which has had three crops, was originally very foul and undrained, and owing to its bad condition has not yielded more than 3½ quarters per acre. The field of 24 acres, which has had one crop, produced only 3 qrs. per acre—a low result—owing to the wheat having been sown after barley, and the field being over-run with wild oats. But the field of 7 acres, which has borne two crops, produced 5 quarters per acre the first year, and 4½ quarters per acre the second year. The straw stood up well.

At present prices the corn is worth per acre say..	£9	0	0
Say 1½ tons of straw at 20s., the price in the district	1	10	0
Total returns	10	10	0
Expenses, labour, and thrashing, &c., say £5; rent, rates, &c., say £2 10s.	7	10	0
Nett profit per acre	£3	0	0

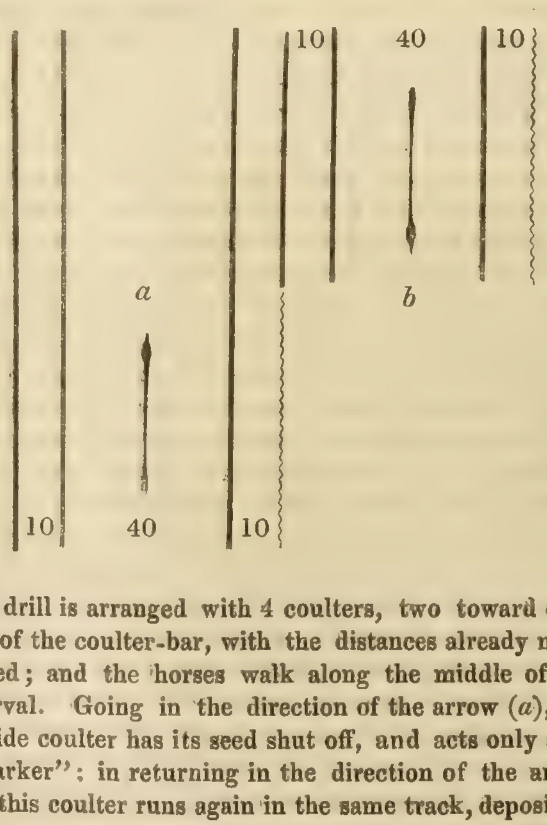
This is at the present low prices, without the application of any manure. The difficulty in the way of an extensive adoption of this plan is the large amount of labour required at one time to effect the digging; and as I shall show, my own method of horse-power cultivation obviates this difficulty, while still bringing enough produce to give a good profit. Before coming to my experience however, I must allude to the trial of Lois-Weedon wheat-growing at Rothamsted, which has told powerfully against the system with some people. Our chemical agriculturist, Mr. Lawes, assisted by Dr. Gilbert, devoted several years of experiment to the subject; and the somewhat unfortunate results were published in the Royal Agricultural Society's Journal, vol. xvii. But Mr. Lawes there says—"My investigations must not be taken to disprove the general applicability of Mr. Smith's husbandry, because I did not strictly follow his rules, and my management differed considerably from his." The trial was made upon 2 acres of heavy loam, with a subsoil of stiff reddish-yellow clay; and the average yield during four years was only a miserable 7½ bushels up to 15½ bushels per acre. The failure arose partially from the excessively scanty-seeding of ½ up to 1 peck per acre, and the undue width of the fallow intervals, but principally from the commencement of the system upon a piece of bare fallow in too rich a condition to bring a healthy crop on the system; the immediate trenching 14 or 15 inches deep (thus burying the 5 or 6 inches of good soil underneath 8 or 9 inches of raw clay), instead of gradually deepening the staple, and the neglect of grubbing and horse-hoeing the fallow intervals, which are the chief means of feeding the growing crop.

3. I now come to the relation of my own experience. The great practical objection to wheat-growing on the Lois-Weedon system has been the supposed necessity for hand-labour in digging; which it is impossible to employ on a large scale in ordinary business. Jethro Tull used the plough; his immediate successors did the same; Mr. Smith also employs the plough between the wide rows of his green crops; and I determined to see whether the improved horse-implements, now so exact and effective in the hands of every farmer, could not be made to answer the purpose of the labourer's spade. Especially as this point only required to be ascertained in order to make way for the steam-plough and cultivator, which will accomplish the tillage so much more cheaply and efficiently. Permission to try a moderate breadth of wheat on Lois-Weedon principles was readily granted by the agent of the estate on which my experiment is being conducted; and I mention this because I hope that other liberal and intelligent stewards will promote, rather than do anything to retard, a wide-spread investigation of this novel introduction into farm practice. My piece is just 10 acres in extent, low-lying, flat, and naturally wet; but relieved of excessive moisture by a few thorn under-drains. These are common in the Lincolnshire marshes—a dead level district, with no "fall" for scouring-out permanent pipe-drains; and they answer tolerably well for several years together, some of those just mentioned still remaining open, though laid 22 years ago. The soil is an alluvial loam; rather too clayey to have had a good character; in fact, the field has always been one of the lowest and worst on the farm. The subsoil is adhesive for a loam, and rests at considerable depth upon silt, or anciently-deposited tidal sand. Mr. Smith cautions us against commencing upon ground in too productive a condition; as the number of rows being less than half what would occupy the land in any usual crops, the wheat is almost sure to be damaged by its own over-luxuriance. In my case, however, the preparatory exhausting was miserably overdone; and indeed Mr. Smith's caution is only against commencing upon land in a really rich state, as after a dead fallow, or a heavy manuring. On my piece the last fallow had been for turnips in 1850; and the last application of any species of manure whatever was for beans in 1854. A heavy wheat-crop on the ordinary plan followed in 1855; succeeded by barley in 1856; and my first year's Lois-Weedon wheat was grown in 1857. Now, to expect a yield of wheat sown after unmanured barley, which itself had followed unmanured wheat, was not reasonable; particularly as, beginning operations too late in the season, I had no time for cleaning one half of the piece; and the hard clods made such a bad seed-bed that the drillman said to sow three pecks an acre like that was "mocking the land." Still I put faith in Mr. Smith and the Tullian tillage; and, without an ounce of any manurial dressing, the 10 acres produced within a trifle of 30 quarters, or 24 bushels per acre. Yet this was the third white-straw crop on the same land. The harvest of 1858 gave just 30 bushels per acre of dressed corn. The crop of 1859 was the largest

and heaviest of all; looking so beautiful when in bloom, and occupying so much space in the stackyard, that the yield was estimated at four quarters an acre. But, alas! the thrashing-machine told a different tale; the average was only 25 bushels per acre of wheat, weighing 60lbs. the bushel. However, the land had produced a crop much heavier than any of its predecessors, though the terribly adverse season refused to develope and ripen the ears as was expected. And, after all, so bad and defective in quantity, weight, and quality were all the wheats in the district, that my yield is not so very much below other people's. The present (fourth) crop is coming on remarkably well, though it is the sixth white-straw crop in annual succession, and the seventh corn crop since the land was manured. You see that, in consequence of my having taken in hand a piece of ground much too greatly exhausted, I cannot come before you with a high average yield. But I am sure that you will at once draw the proper inference, that if land in such a state, after such a flogging course of crops, has produced three wheat crops in succession, averaging 26 bushels per acre, the same cultivation would undoubtedly have given a much greater yield upon ground in a fair condition of fertility. And as my second crop yielded 30 bushels per acre (and the harvest of that year was generally deficient throughout the district), you will agree with me that, on similar land in at all a fair condition, a yield of at least four quarters might be reaped in ordinary seasons. The deduction from my experience so far is that, with the same amount of tillage, any moderately good loam taken at a suitable part of the usual rotation—say after beans, peas, oats, clover, or even roots not richly manured, unless drawn off the land—would be pretty certain to yield 4 quarters; and (judging by Mr. Smith's experience) might yield 5 qrs. or even more per acre: and this for, say, at least two or three years. This important result, with its application to the improvement of our present system of husbandry, I hope to make still clearer by-and-bye; and now pass on to the consideration of the mode of culture, and its expenses and profit. The wheat is drilled in triple rows, the "spaces" (*a a a a*) being 10 inches each, and the "intervals" (*b b*) 40 inches; so that from the middle of one stripe to the middle of the next is 5 feet. Next year's crop is of course sown upon the fallowed intervals *b b*, and the stubble stripes *a a* fallowed in turn, as indicated by the waved lines:

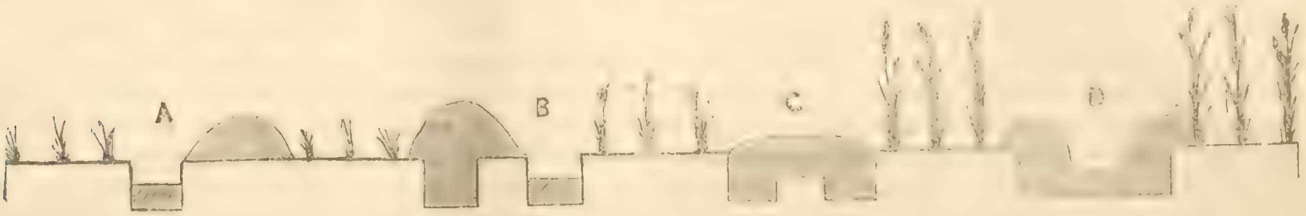


So that though the crop is taken from the whole field the rows do not follow upon the same identical places; and, indeed, instead of being a system of "wheat after wheat, it is in reality an alternate course of "dead fallow and wheat." Hence some people say, why not sow 5 acres with wheat in the ordinary way, and fallow the other half of the field alternately? The answer is that, by interpersing the stripes of fallow between the stripes of corn, the tillage operations of the fallow stimulate and support the growth of the corn. So that my 5 acres of wheat stripes (measuring these by themselves), with fallow stripes between, produced in 1858 no less than 7½ quarters per acre; whereas had all the wheat been by itself and the fallow portion by itself, no such amazing yield could have been looked for. Whatever may be the explanation, at any rate here is proof that tillage in close proximity to the growing plants, and the admission of air and light amongst the green and flaggy stems do wonderfully promote the increase of the crop, at the same time strengthening the straw and saving the grain from the damage always inflicted by lodging and mildew. For while over-heavy crops sown on the ordinary plan, come up a mass of flaccid stems, too weak at bottom to spring up against the weight of rains and violent winds, the stalks of a Lois-Weedon crop are stout, green, and strong, and bear aloft the ears, to ripen and grow plump and heavy in the sunlight. The details of management are abundantly simple. After harvest, fork out couch from the closely-mown stubbles. Broadshare or scarify the fallow intervals, to keep down the weeds. Shortly before seed-time again scarify and harrow; prepare a suitable mould by harrowing, taking care to set the harrows widely apart, in order to miss the stubble rows. The drilling I manage as follows:—



The drill is arranged with 4 coulters, two toward each end of the coulter-bar, with the distances already mentioned; and the horses walk along the middle of the interval. Going in the direction of the arrow (*a*), the outside coulter has its seed shut off, and acts only as a "marker"; in returning in the direction of the arrow (*b*), this coulter runs again in the same track, depositing seed; while the other outside coulter is used as a marker.

Sow 3 pecks per acre, that is, using the same drill-wheel that would sow 6 pecks an acre, if the rows had been 10 inches apart all over the ground, instead of averaging 20 inches as they do. And be sure to get the wheat in early because of this thin sowing and the effects of the after-tillage. When the wheat is well up, take a plough (with two horses in length) once along each interval, the coulter running within 6 inches of the wheat on the near side, and the furrow-slice covering up the old stubble. The furrow may be 5 inches deep, without the upturned earth falling upon the wheat on the other side the interval; and a subsoiler, drawn by say 3 horses in length, breaks up the furrow bottom to a depth of 5 inches more, making a total depth of 10 inches.



The fallow interval thus treated is represented in the engraving at A. In spring, say in February, or as soon as the land is dry enough after a time of frost, perform the same operation along the opposite side of the interval, as at B. In March or April hand-hoe the wheat-rows. In April, when the upturned furrow-slices are in a crumbling state, tear them down by passing a narrow harrow along the intervals; and then stir deeply with a good grubber, set about 26 or 28 inches wide, the horses walking in length. It will be necessary to go over the field with a hand-rake, to pull off any clods that may fall upon and bury the outside rows of wheat. This stage of the fallowing process is represented at C. Horse-hoe the fallow intervals deeply at least twice during the summer; and hand-weed the wheat when requisite. When the ears are fully out and in bloom, take a double-mouldboard or ridge-plough up the intervals, so as to partially mould-up the wheat on each side: this will prevent many stalks from being blown down by winds or borne down by heavy rains. A subsoil-plough should break up the bottom of the furrow left open in the middle of each interval, all this being represented in the engraving at D. The crop may be mown or bagged close to the ground; and bear in mind not to obliterate the lines of stubble by harrowing or otherwise, because these form the "guideways" for the next sowing. It may be necessary to gather the soil again into the middle of the intervals, say by a "pony plough." You will observe that the subsoiled furrows of A, B, and D lie open to the weather for many weeks; and, by the end of the year the whole interval has been exposed and pulverized to a depth of 10 inches, forming an uncommonly fine dead fallow for a succeeding wheat-crop. And as far as cleanliness is concerned, I find that the couch has decreased so as to be now little or no trouble; and a thick mat of buttercups and thistles which pestered the field is also rapidly diminishing. Annual weeds have been annoying and expensive, owing to the access of air and light into every portion of the crop, but are becoming less troublesome every year; and, according to the experience at Woolston, my non-inversion husbandry will ultimately wear them all out. In fact, after bearing six white corn crops in succession, the piece is so free from filth that I should simply have to plough, harrow, and sow, if I chose to have any other sort of crop after the present year's wheat. Now, as to expenses. You cannot tell, excepting approximately, and by assuming some debatable items for granted, what a wheat crop costs in ordinary farming; but, as in this experiment I use no manure and graze no stock, I have simply to reckon the outlay for tillage operations. During the experiment, wages have ranged from 10s. up to 12s. per week, with an addition for harvest; and I allow 2s. 6d. a-day for a horse and implement—which should be enough, seeing that it is equivalent to £37s. 10s. for three hundred working days in a year. At these prices the cost per acre of the several operations has been as follows:—

		£	s.	d.
AUGUST	—Scarifying fallow intervals	0	1	6
SEPT.	—Forking out couch	0	3	0
,,	—Scarifying and twice harrowing intervals	0	2	0
OCT.	—Drilling and harrowing	0	2	5
,,	—Seed 3 pecks (at 5s. per bushel)......	0	3	9
DEC.	—Ploughing and subsoiling	0	3	6
FEB. or MARCH	Ploughing and subsoiling, and removing clods off wheat	0	3	7
APRIL	—Hand-hoeing the wheat	0	1	6
,,	—Harrowing and scuffling the intervals..	0	1	4
MAY	—Hand-weeding the wheat............	0	0	9
,,	—Horse-hoeing the intervals	0	0	10
JUNE	—Horse-hoeing the intervals second time	0	1	0
,,	—Moulding-up wheat.................	0	0	8
,,	—Subsoiling	0	2	0
,,	—Hand-weeding wheat	0	0	4
AUG.	—Mowing and harvesting	1	1	0
,,	—Thrashing and marketing	0	10	0
		£2	19	2
To this must be added, for rent 30s., tithe 8s., rates and direct taxes say 7s.; making together		2	5	0
So that the total expense per acre is		£5	4	2

The outlay being so low, I am able to show you a profit even from the poor yields obtained on my over-exhausted ground. Taking wheat at 40s. per qr., a yield of 21 bushels just meets the expenses; and all above this quantity is surplus for profit and interest of capital. Then, the straw is all clear gain besides, for none of it has yet been returned to the land. How is my ton-and-a-half of straw per acre to be valued, being used as it is for cattle-fodder and for bedding? Surely I shall not be too high in taking it as worth 14s. 2d., which, deducted from the expenses, will leave £4 10s. as the cost of the grain, and this will be repaid by a yield of 18 bushels. My average of three unfortunate years has been 26 bushels, thus leaving 8 bushels, or £2 per acre for interest and clear profit. The nett profit of the crop of 1858, 30 bushels per acre (or 12 bushels over and above the outlay), was therefore £3 per acre; and, as I have before said, had the land been in better order, the produce would undoubtedly have been considerably more than this. Of course, if you dare hope for the old standard market of 56s. a quarter, the profit may be placed at £4 4s. per acre; and those who can make a sovereign a ton of their straw must add about another pound, and so bring up the gain in that case to no less than five guineas an acre! Some people may say that £2 or £3 per acre clear profit is no such great thing for a wheat-crop, even though the price be down at 40s. But remember that this profit is obtained every year, or at least for a number of years in succession, off the same land; whereas the large balance left by a wheat-crop in common farming is not clear, but has to defray the previous outlay for fallowing and the loss by certain crops which cost more to grow than they realize in return. But to show the advantage of growing wheat on the Lois-Weedon system, I will take an illustrative case. I am quite satisfied, from the experience already related, that on any proper wheat-soil (that is, of course, containing a fair proportion of clay in its composition), at least two good wheat-crops in succession may be grown by the system described. I say "two" crops; because after the examples I have adduced, no person can reasonably dispute the feasibility of such a moderate cropping of land in fair order. And you must bear in mind that of these two successive crops, the first will be—say after beans, peas, oats, clover, vetches, or roots; while the second will be sown upon the fallowed intervals of the first; so that wheat will nowhere follow wheat exactly upon the same portions of ground. Such being the case, my unhesitating belief is that a yield of more than four quarters per acre would be obtained from each crop; but say four quarters. And if Mr. Smith's light-land piece, tilled thirteen inches deep, has brought nine crops of 34 bushels each, surely a loamy soil, tilled ten inches deep, may be expected to bring two crops of 32 bushels each. Now, suppose 300 acres arable to be farmed on a three-course rotation (which, by the way, would be rather a novelty), as represented by the following diagram:—

Let 200 acres, A and B, be in wheat; and 100 acres, C, in other corn or green-cropping. Next year, have B and C in wheat, and A in other produce. The year after that, C and A in wheat, and B in other produce. That is, each division would be one year occupied by a variety of cropping; the next year it would be under Lois-Weedon wheat-rows; the third year, again under wheat sown between the stubble-stripes of the former crop; and then broken up for the various cropping. The assumed yield of 32 bushels would give a clear profit (including interest) of £3 10s. per acre, with the expenses already stated, and wheat at only 40s. a quarter. The 200 acres of wheat would thus bring £700 nett annual income. Then, as no manure is required for the wheat, the other 100 acres would have the benefit of all the straw from the 200 acres; and with this large quantity of straw for manure, enriched with corn and cake as in present practice, there would be a chance of a good profit also from the produce of this division. The result, then, is a clear surplus—say of £800 to £900, over and above all expenses, on 300 acres of land, when wheat is down at 40s. There may be difficulties in the way of such a system of husbandry; but the principal one, that of having so much horse-work to be done in the wheat-field at seasons when other crops require their labour, is already obviated in anticipation by the steam trench-plough and grubber. And of course I do not set up this threefold rotation as advisable beyond all others; nor do I preclude the use of artificial manures for the triple-row wheat, seeing that more than 40 bushels per acre may stand and ripen on the land (as at Lois-Weedon); and provided you do not overdo the crop in luxuriance, guano or nitrate will pay handsomely for their use here as well as in ordinary farming.

4. Having now suggested a variety of practical matters for your consideration, flowing from the facts I have detailed, I must add a few words, in conclusion, on the scientific side of the subject. For the chemist enables us to take a reasonable view of these wonderfully prolific effects of mechanical tillage, dispels our fears about premature exhausion of the land, and shows us how to provide against it. A soil-analysis is a capital process for opening a young farmer's eyes. And it certainly is wonderful to see a spit of earth crumbled, roasted, boiled, and, finally, separated into a number of brown, red, and white powders, having the same appearance, taste, and chemical and medicinal properties as similar substances kept in bottles in the druggist's shop. More marvellous still, to learn that the silica and alumina, the lime and magnesia, soda and potash, are simply the rusts of certain metals. Thus, the alumina is compounded of three parts of oxygen gas combined with two parts of the silvery-looking metal called aluminium; so that on strong land containing sixty per cent. of clay, there is enough of this precious metal (in a state of oxide or rust) in one acre of ground, six inches deep, to make ninety tons weight of tea-spoons! Why, it is almost past belief that the principal portion of the sticky clay we find so awkward to cultivate, is really the rust of this light shining silver; and as a matter of fact, is at the same time nothing less than the dust of rubies, sapphires, and other gems, existing in immense quantities in the form of a white powder, easily extractable by the chemist.

The wheat plant, like others. feeds to some extent upon these mineral substances contained in the soil; and a crop of thirty bushels, weighing sixty pounds per bushel, and having over one and three-quarters tons of straw, takes from the land the following quantities of the several ingredients :

	Grain.	Straw.	Total.
	lbs.	lbs.	lbs.
Silica	1.18	142.55	143.73
Potash	10.50	25.50	36.00
Phosphoric acid	16.00	11.55	27.55
Lime	1.19	13.00	14.19
Magnesia	4.25	5.70	9.95
Sulphuric acid	0.112	8.10	8 212
Soda	1.35	1.26	2.61
Peroxide of iron, and loss	0.28	1 85	2.13
Chloride of sodium......	0.042	0.46	0.502
	34.904	209.97	244.874

Of the 245 lbs. of mineral matters in a crop of wheat, 210 lbs. are in the straw ; so that by returning the straw to the land, in the form of manure—not necessarily every year, but say every third or fourth year—we have only to demand of the soil a perpetual supply of thirty-five pounds of minerals, that is, one pound per bushel, sent off the farm in the corn sold; to which must be added the waste of a portion of these substances during the conversion of the straw into dung. What stock of these particular minerals, then, have we in a common loam! The following actual quantities are calculated from an analysis of a loam containing eighty per cent. of silica ; and I will take the depth of staple at ten inches, as calculated in my experiments, the weight of one acre being about 3,267,000 lbs., or 1,458 tons:

			Enough for	
Silica	2,646,666	lbs.	22,144,444	crops.
Potash	26,024	,,	2,484	,,
Phosphoric acid	12,414	,,	775	,,
Lime..............	42,470	,,	35,388	,,
Magnesia	36,590	,,	8,555	,,
Sulphuric acid	2,940	,,	26,222	,,
Soda..............	49,004	,,	37,777	,,
Peroxide of iron, &c.	111,077	,,	396,666	,,
Chloride of sodium ..	" trace."		abundance.	

Were we to take away both grain and straw, without any return whatever, there would be sulphuric acid enough for 366 crops, phosphoric acid for 451 crops, potash for 725 crops, lime for 3,033 crops, and the other minerals in a still larger profusion. So that the only substances that a long-continued series of crops could sensibly reduce are just those which can be readily supplied again in a dressing of ordinary artificial manure. But I advocate the successive growth of only a limited series of wheat-crops upon the various fields of a farm in their turn, the straw being restored to each field in the year occupied by the leguminous or green crop which follows; the foregoing table showing that, with such a rotation, a common loam is practically inexhaustible of mineral constituents. And therefore no landowner or vigilant agent need look grave when tenants ask permission to adopt Lois-Weedon wheat-growing on such land. It is supposed that the various mineral substances exist in the soil in a crude condition unfitted for the use of plants, only a small proportion being directly available as food for the roots. And this stock of liberated or active mineral matter is maintained or increased by exposing the crude substance to the solvents of the atmosphere; which is principally effected by drainage and mechanical cultivation. The action of atmospheric agencies upon the constituents of the soil is too lengthy a subject for notice at this time ; and I need only mention one fact—that the slow and continuous action of rain-water containing carbonic-acid is found to dissolve substances which resist the most biting corrosive acid or the most caustic alkali. The idea that roots take up nourishment only in solution is giving way, however, to a new opinion—that roots are enabled by some process of vital chemistry to feed upon perfectly-insoluble particles of aliment with the surface of which they are in contact. The power with which earth seizes and retains plant-food in defiance of all the natural solvents, has led Liebig to this conclusion : just the theory, you will remember, of our profound agricultural discoverer, old Jethro Tull, on which he built his system of frequent intercultural tillage. How much tillage, then, will provide and prepare a sufficiency of the minerals for the wants of the crop while growing ? Well, the amount of forking and horse-hoing bestowed at Lois-Weedon has been found amply sufficient for a long series of the heaviest crops ; my own ploughing, subsoiling, and scarifying have been found sufficient for several fair crops ; and the cultivation practised in other cases has also been adequate for the purpose. On Mr. Lawes' heavy loam at Rothamsted, one scarifying and cleaning, and one ploughing five or six inches deep, followed by a few harrowings, are found enough for the production of a yield of sixteen bushels per acre, for any number of years in succession. And the corroborative evidence from the steam-farming of Mr. Smith, of Woolston, and numerous other instances, shows that, on any soil not too thin and light, minerals enough for a long succession of heavy corn-crops can be prepared by a very moderate and practicable amount of tillage operations. Besides this terrestrial nutriment, however, plants require "aërial," or organic, food : indeed, all but a fractional portion of the substance of our crops is elaborated and built up out of such unstable materials as gas and water. I cannot now branch off into an elucidation of the absorptive functions of leaves and green stems, and the necessity for having a store of organic matter within the soil, as well as floating in the air above. The only element which it may be feared would fall short in our successive wheat-growing is the expensive nitrogen. No chemist or vegetable-physiologist ventures to say that the wheat-flag and succulent stalk are utterly unable to absorb this element out of the atmosphere in the form of volatile ammonia or other compounds; only the supply in this manner is thought to be comparatively little. Doubts also exist as to the quantity of nitrogen brought down to the soil in one year by the rains and dews, which wash it out of the atmosphere in the form of nitric acid and ammonia ; but the most subtle and delicate analyses appear to show that it is a good many pounds' weight per acre short of the amount required by a wheat-crop. How, then, shall it be obtained without manuring ? Well, there is a good stock of nitrogen already in the soil to begin with. According to Mr. Lawes' analysis of the Rothamsted and Lois-Weedon soil, an acre of land ten inches deep contains $2\frac{1}{4}$ tons of this precious element; or as much as would be removed by five-and-thirty wheat-crops. Our culture will be, therefore, far from permanent unless we can add to the staple as much nitrogen as we abtract from it in a course of years. We can get little from the subsoil; for, rich as it may be as a source of additional minerals, it contains only a third or fourth as much nitrogen as the upper soil. Perhaps we may develope a considerable quantity from another source, namely, by the decomposition of the humus or organic matter of the soil in contact with the atmosphere; it being supposed that nitric acid is formed through the agency of the ozone occasioned by this decay. Be this as it may, there is yet another source of nitrogen, which is perfectly able to furnish all that we require. Nine years ago, Professor Way made the following experiment, wonderfully simple in itself, yet marvellous in the insight it afforded into the properties of soil. He filled a bottle with air impregnated with carbonate of ammonia so as to be highly pungent to the smell. He threw in a little ordinary dry soil, and then shook the bottle once or twice. What was the effect? Why, the ammoniacal smell was entirely destroyed: the dry soil had instantaneously absorbed from the air every trace of the ammonia. He also filled a tube with small fragments of dry clay, and passed through it air highly charged with volatile carbonate of ammonia; and the whole of this gas was arrested. Subsequently, Professor Way spread a very thin layer of clay soil on a sheet of paper, at the bottom of a large cupboard. In this cupboard a small open dish, containing water and lumps of carbonate of ammonia (smelling-salts), was kept heated by means of a little gas-flame. Sufficient air was admitted to cause a gentle circulation; the result being that the cupboard was filled with a moist atmosphere considerably charged with carbonate of ammonia. The soil was exposed to the ammoniacal fumes for several hours, and, upon analysis, was found to have absorbed ammonia at the rate of 3 tons per acre of 10 inches' depth—equivalent to 20 tons of guano. Hence it appears that a roughly-upturned fallow or a pulverulent seed-bed sucks from the passing breezes the ammonia which they bear in minute but ever-present quantity; and as often as we replace the charge of air in the interstices of the soil, it is robbed at once of the nitrogenous element. So that the more extended superficies we can expose, and the greater indraughts of atmospheric air we can let down into the ground, the more nitrogen will our land acquire for our crops. Only till; and you shall have ammonia in plenty: Ceres will not faint for want of the smelling-bottle. How much nitrogen may be absorbed in this way, has never been ascertained; but one thing is certain—the crops that are grown prove that enough and to spare is really obtained. Then, how much tillage is required to ensure this result? Well, Mr. Lawes grew 6 successive crops of barley on unmanured ground, each taking away, in grain and straw, 170lbs. of nitrogen per acre—considerably more than the quantity supplied to the soil in the ammonia and nitric acid of the rainfall. And the annual cultivation which supplied the 170lb. consisted in once scarifying, once ploughing at ordinary depth, and a number of harrowings. At Lois Weedon, the yearly increasing magnitude of the yield, both in straw and corn, shows that the store of nitrogen is augmenting rather than diminishing. And the forking, scuffling, and horse-hoeing, which have caused this accumulation of plant-food, are abundantly cheap, in comparison with the riches thus obtained. I say that, after all these years of wheat-cropping, both the heavy and light-land fields at Lois-Weedon (so far from being exhausted of their native stock of nitrogen) now possess a larger amount of nitrogen than before. Chemical analysis proves it. The subsoil of the light piece contains (according to Mr. Lawes) 3,128 lbs. of nitrogen per acre, in a stratum of 1 foot thickness; while the upper staple contains 6,200 lbs.—just double. Well, the staple has been deepened to 13 inches—more than twice its original depth—the 7 inches of additional staple taking the place of as much subsoil; so that there must be, say 1,500 lbs. more nitrogen per acre in the field than existed there before. The staple of the clay piece contains a proportion of 7,000 lbs. of nitrogen per acre, in a stratum reckoned 1 foot thick; and the subsoil contains only 2,600 lbs. in a similar quantity of earth. As the staple has been deepened from its original 5 inches down to 20 inches, there must have been 15 inches of subsoil replaced by staple soil—that is, there is now a 15-inch stratum, containing nearly three times as much nitrogen as it did before. And the latter wheat-crops are so luxuriant and heavy, that Mr. Smith dare not manure them. Science, then, corroborates the expectation of the practical experimenter that wheat may be grown year after year, for a considerable period of time, without appreciable deterioration of the soil. And it is now for you to consider whether an introduction of two or three successive wheat crops into the rotation, upon heavy or loamy lands, would not secure a handsome profit from the business of husbandry, in spite of cheap corn, and the competition of wealthy gentlemen for every available farm.

Mr. GREENE (Mortivals, Essex), being generally called for, said that he had not attended for the purpose of making any elaborate statement, nor had he risen to advocate the general adoption of the Lois-Weedon system; because he considered that the main objection to it was the large amount of labour that was required at one particular period of the year (Hear, hear). Still, he believed the system did establish or maintain a certain fundamental principle, and was, therefore, interesting. He also thought that it might be carried on advantageously upon a small scale. He should be very happy to answer any questions that gentlemen might like to put to him; but he feared he could add but little to what was stated in Mr. Clarke's paper.

Mr. CORBET: May we take Mr. Clarke's account as correct?

Mr. GREENE: Yes, with the exception of one field, which did not yield quite so much as he mentions. It had not been thrashed at the time, and the yield was not so much as it appeared likely to be.

Mr. WILLIAMS: You, like Mr. Clarke, then, were deceived in it?

Mr. GREENE: Yes.

The **Chairman**: To what extent have you carried out the system?

Mr. **Greene**: Fifty-eight acres.

Mr. **Hobbs**: Can you give us some explanation with regard to the quantity of labour? You say it is very heavy at a particular period of the year.

Mr. **Greene**: The principal labour is in digging the intervals in October. We ought to finish sowing in September.

Mr. **Hobbs**: Then this is after the seed is deposited?

Mr. **Greene**: Yes.

Mr. **Williams**: In digging the stubbles, I presume?

Mr. **Greene**: Yes.

Mr. **Williams**: Could not that be broken up by machinery?

Mr. **Greene**: I think it might.

A **Member**: Steam machinery?

Mr. **Williams**: Of course (Hear, hear, and laughter).

Mr. **Hobbs**: You say you require 20 men for 58 acres?

Mr. **Greene**: Yes; even more if I can obtain them.

A **Member**: You use the spade?

Mr. **Greene**: No; the fork.

Mr. **Hobbs**: What is the cost of manual labour per acre?

Mr. **Greene**: Rather under £4. I reckon that the manual labour and horse labour together make about £4 15s.

The **Chairman**: What is the depth to which you go?

Mr. **Greene**: The depth of forking is about ten inches.

A **Member**: What is the nature of your soil?

Mr. **Greene**: Clay principally. One field contains a great proportion of gravel. The subsoil is chiefly of a loamy character.

A **Member**: Is it at all calcareous?

Mr. **Greene**: Somewhat so.

A **Member**: What is the price you have been paying for labour?

Mr. **Greene**: Rather low lately; 9s. and beer.

Mr. **Williams**: What is the effect of a rough wind upon wheat standing at such an interval apart? Does it get intermixed, or keep a vertical position?

Mr. **Greene**: The general plan is to earth it up in June.

Mr. **Williams**: That I look upon as the great objection.

A **Member**: Have you tried a bean crop upon the same system?

Mr. **Greene**: I have not.

Mr. **Hobbs**: Have you seen the quality of the wheat improve?

Mr. **Greene**: Not in a marked degree. I have seen no difference.

Mr. **Williams**: Are not the ears finer by having the extra amount of light and air?

Mr. **Greene**: The ears are much larger.

Mr. C. **Howard** (Biddenham, Beds.) said that he went down to Lois-Weedon, as a member of the deputation from the Club, to visit Mr. Smith, and found him a most agreeable hospitable gentleman; and, judging from appearances, he must say that, as a parish priest, he was one of the best he had ever seen. As a gardener, too, he greatly excelled; for, upon a small plot of ground, by a beautiful contrivance, he made it appear as large again as it really was. In fact, as he said himself, there were all sorts of tricks practised at Lois-Weedon (laughter). As regarded the soil, Mr. Smith, unlike many landlords, considerably underrated it; and he (Mr. Howard) thought he should be borne out by the practical men who accompanied him, it was as fine wheat land as any man could possibly desire; and with respect to the lighter portions of the soil, it was not, in his opinion, by any means an inferior light soil. As to the portion which was nearest to Mr. Smith's house, and which he stated was new land that had been broken up for 14 years, it must be remembered that had had only seven crops upon it, according to his system. Therefore, most farmers would say that upon new land, with only seven crops they could hardly expect it to be exhausted, considering the quality of the soil. Mr. Clarke had made reference to the machinery which this worthy gentleman had introduced at Lois-Weedon, and which he stated had been so very successful. But the truth was that the whole of the operations upon the four or five acres were performed by the cowman, the gardener, the coachman, and other men around him; and this machinery, so far as he (Mr. Howard) could gather, was not entirely satisfactory to Mr. Smith himself. He must say, moreover, that he was not at all surprised at the crop which Mr. Smith had grown upon that land. Indeed he should have expected that the produce would be still greater, and he rather wondered at Mr. Clarke's average too, because the land in that locality was very far beyond the average of the kingdom for wheat-growing purposes (Hear). Twenty-six bushels of wheat to the acre was nothing very extraordinary; and when he considered that, if they carried out the Lois-Weedon system, they must neglect the growth of roots and clovers, from which they produced their meat, he questioned whether they would be doing right in losing those crops, and going after another, which, certainly, so far as the last few years were concerned, had by no means paid them so well (Hear, hear.) If the Lois-Weedon system was to be at all successful, it must be through the application of steam-cultivation (Hear, hear), and that too upon some of the ordinary wheat soils (Hear, hear.) He felt quite convinced that upon the tenacious clay soils with which many present were acquainted—not such as he found at Lois-Weedon—no farmer would consider himself justified in going to the expense in digging by hand-labour such land 16 inches deep, even if the labour could be obtained. Again, if the system were adopted, the covenants which were now contained in farm leases must be very much altered and modified. They all knew that a strong prejudice existed in some quarters against the farmer taking two white straw crops in succession, and it appeared to him that that would be urged as an objection to the Lois-Weedon system upon many estates. He believed that Mr. Smith managed his four or five acres of land in the best possible manner; but he (Mr. Howard) had left crops of wheat in his own neighbourhood, raised by the ordinary system of farming, which looked quite as well as what he saw at Lois-Weedon (cheers.) With regard to beans; after visiting Mr. Smith of Lois-Weedon, the deputation went to see Mr. Smith of Woolston, who stated that he was at Lois-Weedon twelve months before, and inspected the crops; and when reference was made to the bean rows being five feet apart, the Woolston Smith shook his head, and observed, "That will never do." Mr. Smith of Woolston was evidently a practical man, and he was sure that any opinion which that gentleman might express would be worthy of endorsement by the members of this club; for what the deputation saw on his farm gave them the greatest possible pleasure (Hear, hear.)

Mr. T. F. **Wilson** (Althorne, Essex) stated that he had visited Lois-Weedon several years ago, and he presumed that everybody who had since visited the farm had arrived at the same conclusion he did, which was that the system was utterly impracticable in this country. That it paid the gentleman who practised it he would not pretend to dispute, because there was every reason to believe that he was a truth-loving man; but if the Members of the Club were to occupy a whole week in the discussion of the subject, he did not think that they would be able to evolve any principle from it which would make the system applicable to their farms (Hear, hear).

Mr. **Fisher Hobbs** (Boxted, Essex): According to what they had heard so lucidly described by Mr. Howard that evening, and all they had previously learnt respecting the Lois-Weedon system of cultivation, he should say that there could be no advantage in it to the practical farmer (Hear, hear). He recollected visiting, some 15 or 20 years ago, a friend, who called his attention to a similar system which had been carried out in his neighbourhood for upwards of 15 years, but with no very beneficial results; for it had not attracted the attention of the neighbours, and no one seemed to have followed it out. So far as Mr. Smith of Lois-Weedon was concerned, it appeared that he amused himself on his few acres of glebe land, and employed his poorer neighbours around him, and in this way he was doing good; but to lay his system before this Club as one of general application was altogether absurd. He was quite aware that Mr. Smith was acting with the very best intention; but he felt persuaded that no one could adopt the system on an extensive scale, inasmuch as there was an inadequate supply of labour in the country, whilst if there were a fault in the existing practice, it was that they grew too much wheat already, as wheat had not been a paying crop of late, and certainly it was an exhausting one. The proposition, therefore, to raise wheat alternately year by year was one which he did not think the farmers of England would be inclined to entertain. It was nothing new. They had all read of it in Jethro Tull. One of its advantages was that it promoted the aëration of the soil; but even that they were doing as effectively by other means, and with a good rotation of cropping secured abundant root and green crops (Hear, hear). A few years since, when in France, he was shown a farm of about eight hundred acres, upon which the crops were exceedingly fine. He was invited to point out all the faults that he could discover, and it struck him that one fine field of wheat, which was excessively luxuriant, appeared to be too thickly planted. This was in the month of April. He inquired how much seed had been sown there, and was told 3 bushels per acre. It looked to him as if it would be all down in the straw, and turn out to be a very inferior yield; and he observed, that if they drilled it a foot apart, with one-half the quantity of seed, the crop would be much better. They said they anticipated that that would be his remark; but they had tried the experiment with English drills, and found that at the period of the year when the wheat came on to blossom, if the ground were not covered the root suffered so much from the drought, that the wheat was not worth grinding (Hear, hear). The year previously he (Mr. Hobbs) had what promised to be in the month of June a very heavy crop of wheat upon light land. It was drilled from north to south, and the weather being very hot and dry for some weeks previous to harvest, the yield greatly disappointed him. This practice he now avoided upon light lands, and drilled from east to west, by which means the roots of the plant were now shaded from the rays of the sun. He thought, therefore, that the same principle which the Frenchman had carried out would be beneficial on light lands; and that wide intervals between the rows of wheat would be decidedly injurious, especially upon farms in the south of England (Hear, hear).

Mr. J. **Hooker** (Horsley) said that something analogous to the Lois-Weedon system had been tried in Surrey, with what results the following letter, which he had received from a friend at East Horsley, Ripley, a day or two ago, would show. The writer said—"There were two small patches of wheat down at Horsley under the system you mention, one acre, and a half-an-acre, for several years. The land being near a wood, the game, hares, and rabbits used to frequent this crop more than any other part of the farm. The greatest quantity grown was 30 bushels. I still think that in an open field a small quantity could be farmed advantageously." He (Mr. Hooker) recollected seeing this crop some two or three years ago, and he must say that it did not promise any large measure of success. The ears were very small, and after a smart wind the wheat was much laid. As to the question of soil, if the geological portion of Mr. Smith's farm had to be stated, the Club would be better able to form a correct judgment upon his system. For example, if it were carried out upon a sandy soil, like that at Bagshot, he did not think it would be found to answer very well.

The **Chairman**, as one of the deputation to Lois Weedon, said that, so far as he could see, Mr. Smith's plan was a practicable and good one for his extent of land. His farm was about twelve acres, and upon that it did very well; and if the system were carried out thoroughly upon it, he saw no reason why it should not pay. To think, however, of putting it in operation upon a large scale would be a perfect absurdity. After quitting Lois Weedon, the deputation visited Mr. Smith of Woolston; and he might here state that the next month's discussion upon the substitution of steam-power for horse and manual labour would relate considerably to what they had seen there. He thought that if the two systems were combined—if they could unite the Woolston system with the Lois-Weedon system of alternation, the two might be made to work well; but as to getting such an amount of manual labour as was required by the Lois-Weedon system to trench up the land, immediately after harvest, was, he considered, utterly impracticable, and out of the question. If they could perform the operation by means of the Woolston steam machinery, then it would be all right. In his opinion the Lois-Weedon system was only adapted to small farms. It was very well done, so far as it went, but he concurred with the opinion expressed by Mr. Hobbs, that it was of no use to the practical agriculturist (Hear, hear).

Mr. **Corbet** was sorry that as the discussion had assumed the tone it had done, neither Mr. Smith nor Mr. Clarke were present to answer many of the objections which had been raised. Unfortunately, too, there was no one to advocate the system pursued at Lois Weedon, except Mr. Greene, from Essex, who had been kind enough to answer several questions that had been put to him, but had not done so in the definite way in which Mr. Clarke wrote. No doubt Mr. Clarke would prepare a reply on the present discussion, and publish it in the agricultural papers, and this afterwards would appear in the *Journal* of the club.

Mr. **Skelton** (Wisbeach), in proposing a vote of thanks to Mr. Clarke for his paper and to Mr. Corbet for reading it, said that his opinion, as a member of the deputation, was, that the Lois-Weedon System could never become general, for the simple reason that, on the face of it, it was easy to perceive that it was impracticable. His friend Mr. Hobbs had observed that the system was not new, but was to be found in Tull's husbandry; Mr. Smith, on the other hand, said that Tull's system was never to turn up the subsoil, whilst his was most pointedly directed to that object. In that, therefore, Mr. Smith claimed the merit of novelty.

Mr. C. **Howard**, in seconding the motion, said that he had received a private letter from Mr. Clarke, in which he stated that he was so satisfied with the system that he was anxious to see him (Mr. Howard) become a convert to it.

Now, Mr. Clarke possibly judged his (Mr. Howard's) land by that in his own locality. They all knew that during the summer months, light lands were best under cover—that was to say, shaded; and he thought it would be wrong for gentlemen who farmed light lands to revert to the old system before turnip cultivation, of growing wheat after a summer's fallow, and thereby expose the land to the action of the sun. He believed that upon Mr. Clarke's land the system had been successful; but with regard to the comparison instituted between Jethro Tull's and that of Mr. Smith, perhaps Tull was not so fortunately situated as Mr. Smith. Possibly the former had land whose subsoil he could bring up, whereas Mr. Smith would have to go down a good deal lower than he had yet done to bring any subsoil up (Hear, hear). In fact, Mr. Smith's land was some of the finest he (Mr. Howard) had ever seen for the growth of wheat.

The motion of thanks was then agreed to unanimously; and in responding, Mr. Corbet announced that on the 22nd inst. a special General Meeting of the Club would be held for the purpose of considering the question of the Malt-tax, and how far the Members of the Club would be willing to assist certain local Societies in the re-establishment of an "Anti-Malt-tax Association."

A vote of thanks to the Chairman terminated the proceedings.

Mr. Clarke has since addressed the following letter to the Secretary:—

Sir,—As I could not be present at the Farmers' Club discussion and personally reply to the observations of the speakers, may I request the insertion of a few remarks in the Journal?

The Chairman considers that the Lois-Weedon method, with manual digging, could not be carried out on a large scale, because of the great amount of labour required at once. I think so too; and therefore proposed my modified plan with horse-labour. I also agree with him that a combination of Woolston and Weedon, the intercultural tillage between stripes of wheat being performed by steam-power, would largely add to the profit, while enabling the system to be pursued on a scale of any magnitude.

Mr. Greene's crop on one field was not quite so great as I stated from the particulars with which that gentleman obligingly supplied me. He did not inform me that his last crop had not been thrashed; but the deficiency of such a failing year will make only a difference in my estimate of his nett profit, which may still be £2 (instead of £3) per acre, at present low prices. Mr. Greene, like the Chairman, fully believes in the profitableness of the system on a small scale.

Mr. Williams thinks the earthing-up, when the wheat is in bloom, to be a great objection. At Lois-Weedon, however, it is practically found to answer extremely well; and though a rough wind may twirl the crop considerably, the wheat, however heavy and laid, suffers little injury, because of the open spaces which admit air to ventilate and sunshine to ripen it.

Mr. Charles Howard pronounced Mr. Smith's heavy field to be "as fine wheat land as any man could possibly desire," while the lighter portion is not by any means an inferior light soil. Precisely so; Mr. Smith all along affirms that a soil with a fair proportion of clay in its composition, and free from positively noxious constituents, is well adapted for wheat-growing, and that his system is not applicable to "inferior light soils." But Mr. Howard says, "Mr. Smith's land is some of the finest I have ever seen for the growth of wheat," and "Mr. Smith would have to go down a good deal lower than he has yet done, to bring any subsoil up." This is good evidence in favour of the Lois-Weedon trenching. For this is the character given to the soil after many years of the culture—not its original character before operated upon. Now, it is a splendid, rich, unexhausted wheat-soil, with a staple so deep that 20-inch digging fails to reach a real unmitigated subsoil; but fifteen years ago it had only a five-inch deep staple, and underneath that a "yellow clay subsoil;" and on the occasion of the first trenching (bringing up only a few inches of the raw clay), neighbouring farmers foretold that the field was spoiled, and that Mr. Smith would never get another crop—so he has informed us. No one would then have pronounced the field to be superb wheat-land; but its native mineral riches (common to most clays) have been developed by the clever cultivation bestowed upon it. Mr. Howard should have made allowance for what he very well knows is the transformation effected in heavy soil by deep and thorough tillage, as specially shown at Woolston. It will not do to disparage the results in produce, by making out Mr. Smith's 14 alternate-stripe crops to be only 7 really successive ones upon the same identical space of ground. This only makes the result appear more wonderful still; for you have thus 7 crops of 71 bushels each, or nearly 9 qrs. per acre average, without any manure whatever, instead of 14 crops at 35½ bushels average. Nobody ever heard before of 7 dead-fallow unmanured wheat-crops in succession, yielding an average of nearly 9 qrs. per acre; and the marvel is that this result has been achieved, not on a naturally fertile mould, unprecedentedly rich in vegetable matter, and of the physical quality and texture so highly prized in some favoured districts, but on a good strong soil 5 inches deep, having a subsoil of yellow clay. Mr. Howard thinks lightly of my own 26 bushels average, "because the land in the locality is very far beyond the average of the kingdom for wheat-growing purposes." But what has the high average quality of soil in this neighbourhood to do with my particular plot? for we have in this vicinity some of the poorest silty marsh-land, as well as some of the best wheat-soil. And my piece of ground is exactly what I said it was—so long cropped and worn-out, that to expect a yield of wheat after barley, after wheat, after beans (manured), was, at the very outset, chimerical; but, in spite of two very defective general harvests, and bad markets, I have made £2 per acre interest and profit on each of my three crops—that is, no less than 38 per cent. upon the outlay, with the price at only 40s. per qr. "Twenty-six bushels of wheat to the acre is nothing very extraordinary." Perhaps not; but I maintain that a per-centage like this, upon capital now engaged in farming, certainly is; and profit is the goal of the agricultural race.

Mr. Fisher Hobbs adduces some interesting facts as to loss of yield through scorching of the soil, and suffering of the wheat root from drought just prior to harvest, which results from over-wide drilling. The controversy between the shadists and the advocates of exposure has arisen mainly from the different soils and climates best known to the experimenters. The Lois-Weedon system is not proposed for light lands needing to be covered by summer vegetation; and on suitable wheat soils, in a dry climate, perhaps the stripes would be best drilled east and west. But one advantage of the system is that, while common crops are being parched up without possibility of relief, the wheat-stripes are sucking up moisture from the capillary store existing in the deeply worked fallow intervals, which, repeatedly stirred and pulverized by the horse-hoe, imbibe the refreshing dews.

Mr. Hooker instanced an unsuccessful trial of the plan, in which the hares and rabbits appear sadly to have wanted Mr. Corbet among them. Of course Mr. Smith would not succeed very well upon the "Bagshot sand;" his system is adapted for his own land—the heavy soil of the oolite formation, and for many thousands of acres naturally of similar character.

Mr. Skelton justly discriminates between the double-spit digging of Mr. Smith, and the "never-plough below the staple" of Jethro Tull, the father of drill-rows and intercultural wheat-crops.

Mr. Wilson's opinion that no principle can be evolved from the Lois-Weedon system, which would be "applicable to our farms," is rather too lengthy a subject to be followed up in this communication. At the risk of being classed among the theorists, I must affirm my conviction, from the practical trials made, that on some suitable soils it is practicable, and will pay to grow cereals and other corn on Lois-Weedon principles (either with horse or steam power), in preference to keeping any live stock beyond the animals necessary to till the land and eat the straw into manure. On some other soils this new method of grain-culture may be profitably combined with the growing of roots and clovers for sheep and cattle breeding; and there are also soils on which the system would be a failure instead of an advantage. I am, Sir,

Your obedient servant,
Long Sutton, Lincolnshire, JOHN ALGERNON CLARKE.
May 15*th*, 1860.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—I received a copy of the *Mark Lane Express* yesterday morning, and in the evening sent for my tenant. I told him what the Deputation from the Farmers' Club had unanimously resolved—that my land was the best wheat land they had ever seen. "Now, Stuchfield," I said, "you have nearly four hundred acres of mine, the greatest portion of which is of exactly the same quality with the field in question, with this difference, that whereas my land had only a five-inch staple, and yellow clay under it, yours has a clay subsoil with from five to ten inches of staple. So that you see yours is better than the best wheat-land ever seen by the Farmers' Club; and this being the case I cannot do otherwise than raise your rent at once from 27s. an acre to 50s. at least, with an increase to my income of £400 a-year." We then talked over the fact of the whole parish of two thousand acres being generally of a similar quality, a very small portion being worse, a great portion better. In fact, the whole geological formation of the same oolite, to the extent of tens of thousands of acres running right across England from Dorset to Whitby, is much of the same quality, and rented at much the same sum, that is, from 27s. to 30s.

The gentlemen of the Deputation, without knowing the reason, were stating the fact, notwithstanding. Inch by inch this clay subsoil of mine has been brought to the top and mixed with the staple, till, from a yellow clay, it has become, gradually, a fine dark loam from fifteen to eighteen inches deep, or more. This has been a progressive work of sixteen years, after I had first pared the turf, and taken it off the land. And the deputation were quite right when they walked over its surface, and pronounced it to be the best wheat land they ever saw. It really is so. "Why, it's worth 45s. an acre!" said one. He was much below the mark. It is well worth 60s. an acre; and if I were to let it, it should not be for a shilling under.

"*The produce not so much as you expected?*" What! nearly five quarters of wheat to the moiety of each acre, being at the rate of nearly ten quarters per acre, and "not so much as expected?"

"*The plan impracticable?*" Surely not. It might have been thought so once, but that time has past. A principle can be exhibited as clearly on five acres as on five hundred. I may fairly, then, suppose a case. I will suppose a farmer to have a four-hundred-acre arable farm, and that he sets apart a hundred acres of it for wheat upon the Lois-Weedon plan. I will suppose his land to be like mine, with a five-inch staple, and a good heavy clay under it. Immediately after harvest the steam cultivator "smashes it up" for the first time, stirring and bringing up within reach of the frost two inches of this subsoil, making seven inches in depth altogether. This depth of virgin soil will be sufficient for four years. In the Spring and during Summer, and up to September the farmer cleans and stirs and prepares the land as for barley. After that, and year after year, he carries out the plan without any forking by hand at all, trenching as he goes deeper with the steam trenching implement. Why, steam not merely makes the plan feasible, but lessens the expense of tillage from 34s. to 8s. or 10s. How is the plan impracticable, then? Suppose the farmer to do well what he does do, and consequently *to succeed*—for I reject the unpleasing flattery that I can accomplish what others cannot—he then gains, with low prices, a net profit of £500 a-year from one-fourth part of his 400 acres. He has his clover, roots, stock, &c., on the remaining three-fourths of his land, which he deals with in the ordinary way, in whatever rotation he may choose, including wheat, as a separate farm. Your obedient servant,

Vicarage, Lois-Weedon, May 16. S. SMITH.

CENTRAL FARMERS' CLUB.

A meeting of the committee was held at the Club House, New Bridge-street, Blackfriars, on Monday, May 7; L. A. COUSSMAKER, Esq., in the chair. There were also present, Messrs. N. G. Barthropp, R. Bond, C. J. Brickwell, J. Carter, T. Congreve, J. Cressingham, W. Fisher Hobbs, C. Howard, J. G. King, E. Little, T. Owen, B. P. Shearer, S. Skelton, G. Smythies, J. B. Spearing, James Thomas, John Thomas, H. Trethewy, J. Tyler, and J. A. Williams.

The minutes of the last meeting were read, and the usual monthly statement of accounts was received.

The following members were elected.

R. J. Clarke, Tooting.
F. C. B. Ford, Marshall's, Maresfield.
P. H. Frere, Downing-terrace, Cambridge.
G. Kennard, East Farleigh, Maidstone.
J. L. Kennedy, Ardwick Hall, Manchester.
R. Simpson, Haggestone, Berwick-upon-Tweed.

Ten other names were read for the first time.

The thanks of the committee were ordered for the following works presented to the club:—

"The Gardener's Chronicle and Agricultural Gazette," weekly, by the Proprietors. Twelve copies of "A Word in Season; or How to Grow Wheat with Profit;" by the author, the Rev. S. Smith, of Lois-Weedon, Towcester. Fifty copies of a "Letter on Steam Cultivation, addressed to the Right Hon. Benjamin Disraeli, M.P.;" by the author, Mr. W. Smith of Woolston, Bletchley. "Practical Essays on the Improvement of Farming;" by the author, Mr. Hewitt Davis.

A deputation from the Ipswich Farmers' Club, consisting of Messrs. Beckett, Garrard, Hempson, Hitchcock, Orford, and Cobbold Perry, had an interview with the committee on the subject of the Malt Tax. Mr. Beckett, on the part of the deputation, explained that a recent movement had been made in Suffolk for the repeal of the Malt Tax, that a number of petitions had already been signed, and that the present was considered a very favourable opportunity for pressing the question. Mr. Hempson and Mr. Hitchcock also dwelt upon the unfairness of the duty, and the necessity for its abolition The object of the deputation in asking this interview was to endeavour to ascertain how far they might depend upon the support of the members of the Central Farmers' Club in the event of an Anti-Malt-tax Association being re-established.

The committee, in order to give the whole body of members an opportunity of expressing themselves, resolved to call an extraordinary general meeting of the Club for this purpose. It appearing that general meetings of the Royal Agricultural Society as well as of the Smithfield Club would be held on Tuesday the 22nd of May, it was determined to fix the club meeting for the evening of the same day, at half-past six o'clock.

BERKELEY AND THORNBURY AGRICULTURAL ASSOCIATION.

At the time when the Berkeley Vale Agricultural Association was first proposed, it did not occur to the promoters of the society that a local Farmers' Club on a small scale, comprising about nine parishes, was formed last year, under the denomination of the Thornbury Farmers' Club, and that ploughing matches were held in September. It has since transpired that an exhibition of stock was contemplated to take place sometime about Christmas next. The first proposition of the Berkeley Vale Association was to include the whole district from Gloucester to Bristol, a fine fertile vale, bounded on one side by the river Severn, the capabilities of which are great; and, as new rays of light are constantly shining on the science and practice of agriculture, they are open to much advantageous development and improvement. Under these circumstances, Henry Howard, Esq., of Thornbury Castle, and other influential landed proprietors in that neighbourhood, considered that an amalgamation would be conducive to the prosperity of both societies; and an arrangement which has been finally concluded upon the most satisfactory and amicable terms. Annual exhibitions of stock will be held alternately at Berkeley and Thornbury; and Sir Maurice Berkeley, with his invariable consideration for the welfare of the farming interest, has offered the use of his extensive and newly-erected homestead for the purpose of holding the first exhibition, which is to take place in October or November next. Sir Maurice has also expressed his intention of giving a special premium—a worthy example, which will probably be followed by many of the other wealthy landowners in the district. Liberal premiums will be given from the funds of the society for cattle, sheep, horses, pigs, cheese, and roots; also prizes for deserving servants, for which the sum subscribed is very ample. Ploughing matches will also take place, the time of which is not yet decided, but it will probably be in the month of September. One of the matches will be open to public competition, as an inducement to experienced workmen to exemplify their skill with implements of the most approved construction. Discussion meetings will be held during the winter months, alternately at Berkeley and Thornbury. Many benefits and advantages will spring forth from this association. It cannot be denied that the march of improvement in dairy farming has not kept pace with other branches of agriculture. Machinery and implements have been introduced to a vast extent for the cultivation of arable land, but, with the exception of Keevill's cheese-making apparatus, and a recent invention to extract butter-milk, and facilitate the making up of butter, we know of nothing to mitigate the labours of the farmer's wife whose attentions are devoted to dairy management.

TORRINGTON AGRICULTURAL SOCIETY.—The annual exhibition was held on May 18. The following is the prise list:—HORSES: Best thorough-bred stallion, £4 to "Speed the Plough," the property of the Hon. Mark Rolle. Best cart stallion, £2, to "King of the County," the property of Mr. Thomas Pellow, of Okehampton. Best colt for the saddle, £2, to Captain Arnold, of Iddesleigh. Best brood mare, £2, to G. Braginton, Esq., of Torrington; and for the best cart brood mare, £2, to Mr. King, of Meeth. CATTLE: Best bull, £3, to Mr. Thomas Hooper, of Petrockstow; second, £2, to Mr. Turner, of Dowland. Best yearling bull (premium given by T. H. Lake, Esq.), £2 2s. to Mr. Thomas Norman, of Frithelstock; second, £1 1s. to Mr. Richard Balsdon, of Westleigh. Best Devon breeding cow, £2, to Mr. Thomas Snell, of Merton; second, £1, to Mr. H. P. Bonifant, of Petrockstow. Best heifer, not exceeding four years old, £2, to Mr. H. P. Bonifant, of Petrockstow; second, £1, to Lord Clinton. Best heifer, not exceeding two-and-a-half years old, £2, to Mr. James Risdon, of Hartleigh, who likewise obtained the second prize of £1 for a similar animal. Best heifer, not exceeding one-and-a-half year old, £2, to Lord Clinton; second, £1, to Mr. W. Risdon, of Dolton. SHEEP: Best ram, £2, to Mr. C. Clement, of Alwington; second, £1, to Mr. G. Andrew, of Barkham. Best ram, two years old, £2, to Mr. C. Clement, of Alwington. Best hogg ram, £2, to Lord Clinton; second, £1, to Mr. C. Clement, of Alwington. Best pen of six ewes and lambs, £2, to Mr. J. B. Torr, of Westleigh; second, £1, to Lord Clinton. Best pen of six ewe-hogs, £2, to Mr. Thomas Norman, of Frithelstock; second, £1, to Lord Clinton. PIGS: Best boar of the small breed, £2, to Mr. John Penhale, of Buckland Brewer; second, £1, to Lord Clinton. Best sow of the small breed, £2, to Mr. W. Risdon, of Dolton, who was also awarded the second prize of £1. Best boar of the large breed, £2, to Mr. John Luxton, of Merton; second, £1, to Mr. A. Clement, of Parkham. Best sow of the large breed, £2, to Mr. G. Andrew, of Parkham; second, £1, to Mr. T. Lee, of Shebbear.

SHEEP WARRANTY: IMPORTANT TO FARMERS.

On Wednesday, May 9, the following case was tried at the Salisbury County Court, before the Judge, Edward Everett, Esq. It has excited great interest in the counties of Somerset and Wilts:

John Strong v. *Charles Phillips.*

This was an action to recover the sum of £33 4s. 6d., for a breach of warranty on the sale of some sheep by the defendant to the plaintiff. The case was originally tried in this court in January last, when a verdict was given for the defendant. At a subsequent court, an application was made for a new trial, on the ground that the verdict found by the jury was contrary to evidence. His Honour granted the application on condition that the costs of the first hearing should be paid by the plaintiff. The case accordingly came on for re-hearing on Wednesday last, before a jury, and the court was crowded throughout the trial, which lasted from twelve until after seven o'clock. Mr. Edlin, of the Western Circuit, instructed by Mr. Balch, of Bruton, and Messrs. Squarey and Whatman, of Salisbury, was counsel for the plaintiff; and Mr. T. W. Saunders, of the Western Circuit, instructed by Messrs. Hoddings, Townsend, and Lee, was counsel for the defendant.

Mr. Edlin, in opening the case, said that Mr. John Strong, the plaintiff, was a farmer living at Evercreech, in the county of Somerset, and Mr. Charles Phillips was also a farmer living at Burford St. Martin, in the county of Wilts; and the action was brought for a breach of warranty respecting the sale by the defendant to the plaintiff of 52 ewe sheep at Wilton Fair, on the 12th of September, 1859, which the defendant warranted sound. His case was, that this was a false warranty, that the sheep were unsound, and that his client was entitled to recover damages for the loss which he had sustained by reason of such unsoundness.

John Strong deposed—I live at Small Down Farm, in the parish of Evercreech, Somerset. On the 12th of September last I was at Wilton Fair, when I agreed to purchase 52 sheep of Mr. Phillips, at £1 13s. 6d. per head. I asked him how it was they were so poor, when he replied, "If you had seen the downs on which they have been feeding, you would not wonder at that, as they have run on the poorest down in Wiltshire." I asked him whether the sheep were sound, and he said, "Hear! I'll warrant them sound." Upon that warranty I bought the sheep and paid for them. Mr. Coles, a farmer, was present at the time. I paid the defendant in a refreshment booth £87 2s. for the sheep. They got home to my house on the 14th of September. I put them on a piece of ley. On the 18th of September—four days after the arrival of the sheep—one of them died. Another died on the 26th, a third on the 30th, and a fourth on the 7th of October, On the 4th of November one died, and another on the 6th. Mr. Ashford examined that one. I lost another also on the 17th of November. On the 26th of that month I sent for Mr. Hoddinott to kill one of the sheep. I examined the liver. I also examined the livers of the sheep which were shown to Mr. Ashford. They were all in a similar state, and there were flukes in the livers of all the three sheep. About a fortnight after Wilton Fair I bought twenty sheep of Mr. Green, at Shepton Mallet market, and they were depastured with the other sheep. Nothing happened to them, and they are all now doing well. My land is dry and healthy, and sheep have been depastured there in consequence of its healthiness. In my father's time, twenty years ago, I remember 200 ewes, belonging to Mr. Whittaker, of Bratton, wintering there. These sheep were tested in going in and coming out. Two of them were killed, and they were in a sound condition. I sent for Mr. Hoddinott, who came and killed a sheep. Afterwards I instructed my solicitor to apply to the defendant, and in consequence of his not meeting my views, I ordered the remainder of the sheep to be sold by auction. They fetched altogether £57 1s. 6d. I have known the defendant for many years, but never had any dealings with him before.

After hearing other evidence in support of the case, Mr. Saunders addressed the jury for the defence. He contended that no warranty was given; and secondly, that the sheep were not unsound when they were sold, but became so after they were in the possession of the plaintiff. He should shew that these 52 sheep were only a portion of a larger flock which had fed upon the defendant's farm; that he had sold 70 of this flock to a person named Noyce, two to a butcher at Barford, and others to a person named Millard, at Salisbury, all of which were sound. Mr. Phillips would swear that he had never had an unsound sheep upon his farm since he had lived there, and if these statements were true, they went to show that the sheep were sound when they were sold, and they must have got diseased after they were out of his possession. He suggested that the sheep were driven an unreasonable distance for one day, and that they had taken the disease either on the road from Hindon to Batcombe, or when at the latter place, which had a bad reputation for bane sheep.

Mr. Charles Phillips, the defendant, deposed—I live at Barford Farm, about three miles from Wilton. Before Wilton fair I had a flock of about 600 sheep. I sold 70 of these to Noyce. They all fed on the same land—sometimes on the arable, and sometimes on the down. Three days before the fair I sold two sheep to Mr. Lever, and on the 7th of November I sold 10 of the same flock to butcher Millard, of Salisbury. They were all fed on the same place. I never had any baned sheep on my farm. I will swear that most positively. On the 12th of September, at Wilton fair, I sold Mr. Strong 52 sheep, at £1 13s. 6d. a-head. I never warranted these sheep. I believe the sheep were sound when I sold them. I am quite sure that I said nothing about a warranty. Several other witnesses, including two veterinary surgeons, were also examined.

His Honour then summed up to the jury. He observed that there was no denial that the sheep were diseased; the only question was when they became so diseased. There were two points in the case. First, was there a warranty or not? If there was no warranty given at the time of the sale, then the defendant was not liable, and the plaintiff must put up with a bad bargain. But secondly, the question was, had these sheep the seeds of disease in them at the time of sale at Wilton fair? Had they those seeds which became more developed afterwards? The great point for the jury to determine was whether or not the sheep were in an incipient state of disease when they were sold at Wilton fair.—The jury immediately found a verdict for £33 4s. 6d., the amount claimed. His Honour said that if it was any satisfaction to the jury, he perfectly agreed with the verdict.

THE INFLUENCE OF ATMOSPHERIC PHENOMENA.

In another column the reader will find some correspondence on the atmospheric phenomena of the vernal equinoxial week, from the 18th to the 25th of March of the present year, with suggestions respecting such influence over, or connection with, the ensuing summer. The science of Meteorology is the one of all others with which we have the most to do, and on a proper attention to which our physical comfort and happiness, and frequently the continuance of life itself, depends. The word embraces all physical causes that affect the state of the atmosphere; and therefore its phenomena enter into and determine the quality, in a sanitary sense, of the primary element by which vitality is sustained. From the cradle to the death-bed we are dependent on these phenomena, and enjoy, or suffer, in accordance with their influence; and the well-being of our future physical condition—the possession of a sickly or a healthy constitution—is not unfrequently determined for life by the air inhaled or the liquid imbibed in the earlier stage of existence. It is well understood that the injurious action of a malarious atmosphere is, at all stages of our career, the most prolific source of endemic and epidemic disease, and of premature death.

But it is not man and the inferior animals only, that are affected by atmospheric phenomena. We see, in fact, their influence in a much more direct and positive form on the vegetable world at every stage of their existence, and in most cases feel our utter helplessness to avert or apply a remedy to them. In the case of animals we can, by medical appliances, relieve or remove disease arising from atmospheric as well as other causes, or we can remove the sufferer into a more genial locality, where the acting cause does not exist. But the vegetable tribes are fixed in their position, and must stand the brunt of all the changes which the fitful seasons and the climatic variations inflict upon them. The drought, the deluge of rain, the biting east wind, the devastating storm, admit of no alleviating appliances; and the husbandman, when he sees his crops injured or destroyed by them, feels that he is in the hands of an irresistible Power, and must suffer in silence and acquiescence to an omnipotent will.

The science of meteorology is still in its infancy, and our knowledge respecting the occult and multiplied causes in operation upon the atmosphere is still very imperfect, notwithstanding the great advances made in the physical sciences. There is every reason to believe that the various changes in the atmosphere are the result of fixed laws, probably, when known and understood, as simple and invariable as those which move the heavenly bodies in the solar system. If we could arrive at data sufficiently clear and exact, each of those atmospheric phenomena we behold might be traced to its true cause, and we should be able to predict the future state of the weather with as much correctness as we now calculate the eclipse or a conjunction of the planets. But the great and insuperable obstacle to the acquisition of such knowledge is that the cycles in which the various meteorological agencies affecting our globe move, are some of them of such immense extent, that the probable duration of humanity itself would not suffice to record all the changes they produce. "If," says Dr. Thompson, "the buried relics of primeval life have taught us how brief has been our tenure of this terrestrial Paradise, compared with its occupancy by the brutes that perish, the sidereal truths we have been expounding impress upon us the no-less humbling lesson that from the birth of the first man to the extinction of his race, the system to which he belongs will have described but an infinitesimal arc of that immeasureable cycle in which it is destined to revolve."

It is evident that if the meteorological phenomena of our globe are regulated by cycles of such protracted duration or extent, it will be in vain to expect to understand their influence. But whilst there cannot be a doubt of the reality of that influence, there are other shorter, inferior, and subordinate periods, in which the weather nearly, though not absolutely, returns after the same order. The chief agents operating directly upon the earth's atmosphere, are the sun and moon, and their revolutions are the primary and predominant causes of the changes we witness. Thus the moon's cycle occupies nineteen years, in which its motions coincide with those of the sun; and as her nodes perform their revolutions in nearly the same time, meteorologists have observed that nearly the same series of changes in the weather have returned.

The utmost knowledge, therefore, of the abstruse science of meteorology is that gathered from observation, extending over series of years, carefully recording the results, day by day, month by month, and season by season. This has been the course we believe pursued by Mr. Du Boulay, who in his letters, in another column, gives us the result of his experience; and whatever may be thought of the theory he has laid down in them, they are drawn up with that modesty which the abstruseness of the subject, and the imperfection of our knowledge, coupled with the incompleteness of the data upon which an opinion can be formed, naturally inspire in the man of science. There can be no difficulty, after a series of observations, extending over a number of years, of laying down general rules by which the phenomena of the future may be with some confidence expected to occur; at the same time, it must be confessed that these rules will be liable to the action of disturbing causes too occult to be reached, or too erratic and fitful to be calculated upon. There are also other agencies, such as the conjunction of a planet or the sudden appearance of a comet, which will undoubtedly affect the atmosphere, and probably counteract in some degree even the more direct action of the sun and moon*.

Notwithstanding these drawbacks, the public will, we are sure, feel obliged to Mr. Du Boulay for his letters; and far from considering him "a charlatan," will think that he has done good service by bringing his thirty years' experience and observation to bear upon this subject, in order to throw light upon what has hitherto been shrouded in impenetrable darkness. It is said, what has no precedent admits of no prognostic; and this may apply to the unprecedented state of the weather at the equinox. Still we may judge from analogy; and we shall, therefore, look with great interest for the result, on which, in fact, depends much more than the solution of a question in natural philosophy. The husbandman will watch with deep anxiety the progress of the season after so unpropitious a spring, and will avail himself of any information that will enable him, if not to avert, to meet and alleviate, as far as circumstances will permit, a prospective calamity.

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* "M. de Lagrange has established, by demonstration, that all the changes arising from the disturbing forces of the planetary system, are subjected to vast cycles, on the return of which the same motions are perpetually renewed. Similar periods, but of an extent to affright the imagination, probably regulate the modifications of the atmosphere; for whenever a coincidence of circumstances prevails, the series of appearances must inevitably recur."—*Encyclopædia Britannica.*

Sandgate, April 3, 1860.

I now wish to call your attention, and, through you, public attention, to the connection which I am deeply persuaded myself exists in these latitudes between the atmospheric phenomena prevailing during the spring equinoctial week from the 18th to 25th March, and the atmospheric phenomena prevailing during the ensuing summer, so that the one is an epitome or index of the other whenever it has anything in it remarkable to distinguish it at all. It is most desirable for the public gain that, if my convictions are well founded, the fact should be known; for there is something gained if, even only two or three months beforehand, we should have a reasonable warning of what we might probably expect in this matter. An admirable occasion now presents itself for testing the truth of the views I have enunciated, and which I have examined into for thirty years; because during that period I never witnessed an equinox resembling the last, or in any degree approaching it in character.

Almost always the weather is moderate in character, and the wind during the week moves from every quarter. This year the winds have two or three times blown from S., S.W., W., and N.W. with the violence of a hurricane during that week, and they have never moved from any other quarter. The sun was almost always clouded, the nights alone on two or three occasions clear; and, in fact, the whole week was a tempest, with intermissions from S.W., S, and N.W. What all this is to lead to I do not know. I will not venture one farthing upon the result, except in this, that I venture my reputation in thus saying that I think there exists a preintimation in March of remarkable atmospheric phenomena following during the summer; and by thus risking my name and reputation for a public always ready to attack both, I venture what some would not dare to do at all. My interest it is, and sole interest, to see the winds gentle as usual in character, bringing beauty and fertility in their train. My observations during thirty years would lead me to expect a summer unexampled in its tempestuous character. My especial object in writing to you is that you would do all in your power, without injuring any, to draw public attention to what I now am writing, in order that, if I am wrong or mistaken in that which I believe to be a law, I may learn it, and sit down humbled, but not less humble than I am now; and that if my views seem founded on truth, my countrymen may, in future, derive from the knowledge whatever advantage it pleases Providence may be derived therefrom. I do not believe that the summer season preintimated in March really begins till May. April has in it a good deal of the remains of the winter; and I have sometimes known the tendency of N.E. winds in May, and even part of June, so strong as to overpower for a time the preintimations of March; but if they do, the preintimations are afterwards carried out with a strength proportioned to that delay. You may publish this in every way you choose. I wish that such an opportunity of testing a remarkable connection, if it exists, should not be lost to the public. The weather I have alluded to extended over the whole of the British islands, north and south, and therefore the indications apply to the whole also. This is seldom the case—I mean that England, Ireland, and Scotland shall have in all parts the same equinoctial phenomena. I have offered to read an essay containing what I think on this subject of a society at Oxford, if an opportunity offers.

Thomas Du Boulay.

London, April 5, 1860.

We feel much obliged for your letter of the 3rd inst. Certainly, if your observations this season prove as correct as they were two years ago about the drought, there would seem to be something in them; but we find the feeling generally prevailing already that this season is likely to be one of a late character, and that the crops are now, at all events, not in a state to indicate abundance to the country: however, the result may be quite otherwise, though present appearances be against it. Providence has certainly allowed man to get much additional knowledge in this country; but whether it be intended that he should have amongst this knowledge information as to the future weather no one can say. Would you like us to try to get your letter into the *Mark-lane Express and Agricultural Journal?*

Sandgate, April 6, 1860.

I should like you to try and get this correspondence inserted in the *Mark-lane Express*, and I should like to hear particularly any observations on this subject they may make. I know I may, and shall be, looked upon as a charlatan; but as what I have said and have to say is, and will be, said with due modesty, I fear nobody. I have said that, from oft-repeated observation, I am convinced that anything very remarkable in the equinoctial week, as to the movement and state of the air, adumbrates similar phenomena on a larger scale, to be repeated from time to time during the ensuing summer in the same tract of country, so as to give that summer a decided character when it is over, and we can make a judgment on it. You allude in your letter to my anticipating a very dry time the summer before last. Now, turn to last summer. I told you I was convinced it would not be dry—that the drought was gone. The rain that fell was above the average; and the principal characteristic of the summer, in the midland and southern counties, was that it fell repeatedly in the shape of very heavy thunder-showers, and knocked down an immensity of wheat and other crops. You will find that here and there all through the tract I have named, during the equinoctial week preceding, a little hail or rain-shower was precipitated, accompanied (and it is very unusual at that time of the year) by a clap of thunder, or perhaps two. I know this was so, for I saw it mentioned in more than one paper. I think there was a connection between that movement in the air during the equinox which caused the one, and the greater movement in the air, repeated more than once, which caused the other. However, we now come to a testing point: here is an equinox or equinoctial week, with the heavens repeatedly in the wildest possible state, and the atmosphere repeatedly in the greatest commotion, rushing from S. and S.W., and then a cessation for a time taking place, with the wind W. or N.W. A considerable fall of rain took place on the evening of the 23rd March, in the midst of a tempest of wind from the S., and smaller quantities on one or two occasions before. I do not pretend to be a prophet; I believe the Almighty keeps in his own hands the secrets of the winds, the origin of all the weathers, and that the footstep of human scientific research is not approaching thereto: but still, as when the western sunset is glowing we are permitted to say that it will be a fine day on the morrow, so perhaps the equinoctial week may give us a clue to what may probably be coming.

Thomas Du Boulay.

CATTLE KILLED BY LICKING PAINT.—Last week two short-horn bulls, about sixteen months old, in a lot of twenty-five, the property of Mr. Clarke, upon New Moor Farm, Southminster, were seized with frothing at the mouth, affection of the brain, and other symptoms, from which one died the next day, and the other was necessarily killed. Mr. Howe, veterinary surgeon, on hearing from the shepherd that the animals had licked some lead-coloured paint from off a part of the buildings, immediately pronounced it to have occasioned the attack, and on a *post mortem* examination the mortal effects of the poison were clearly developed.

REVIEWS.

THE DUTIES AND PRIVILEGES OF THE LANDLORDS, OCCUPIERS, AND CULTIVATORS OF THE SOIL. A Paper read to the Members of the Faringdon Agricultural Association, by MR. JOHN BEASLEY, of Chapel Brampton, Northamptonshire.

This is allowed to be a very practical age that we are living in. Men are more intent upon work than talk; or if they do discourse, it must be, as the cant of the day says, "with a purpose." The halcyon times of *fine* speeches have passed away. The well-rounded periods, the conventional clap-traps, and the unmeaning generalities can no longer be depended upon. The *cheers* and *hear-hears* are reserved for something a little more tangible; and while one audibly inquires "What *is* he driving at?" his neighbour calmly sinks into a sweet sleep, or sets his mind a thinking on something else. Whether it be in the Senate House, the Theatre, the School or the Lecture Room, we find the same determination in favour of plain dealing and plain speaking. There must be material and matter to now make a speaker effective. Stale truisms, however artfully dressed up, or copy-book precepts though ever so prettily put, are apt to pall upon the taste after a time, and the appetite to long for something fresh and wholesome. If a man cannot "say it out" at once he had better sit down.

There is no class in society come to insist on this with more resolution than the farmers. They not merely expect as much one from another, and carefully avoid a windy orator as they would a murrain beast, but they imbue other people with something of their notions. Country gentlemen and county members know this well enough, and become more pointed in what they have to offer. A prosy parson at a public meeting will very soon sink to his level, and a chattering townsman be even more readily reduced to "order." We really believe that it is but a full cognizance of this fact which keeps the magnates of Hanover Square in such continual dread of another dinner. They feel that twaddle will not do, and that if they speak at all they will have to speak out. Even Science herself has to submit to such a force of circumstances, and when men like Professor Way or Mr. Nesbit proceed to enlighten us, it is by giving us facts and principles in the plainest possible terms. Mysteries and mere technicalities are studiously avoided, and the more openly and unreservedly the Master expresses himself, proportionately the more is he appreciated.

"The Duties and Privileges of the Landlords, Occupiers, and Cultivators of the Soil" is a theme that one would take to promise well for a little plain speaking. We might expect this the more when we find it in the hands of so experienced a gentleman as Mr. John Beasley, of Chapel Brampton, Northamptonshire. But it is not so. The duties of landlords and occupiers do not seem susceptible of any very definite expression. They rather appear to be clouded in an atmosphere of mutual sympathies, moral maxims, and Delphic edicts, that may mean very much or very little. It entirely depends upon the way in which you interpret them. The owner of the property should be a good landlord, and the tenant should know his business, and the labourer should have a good cottage, and so on. But let us take a sample or two of the style in which Mr. Beasley faces a question that ought to have so much in it:—"I am one of those who think that you should never defer until to-morrow that which can be done to-day. I have had in my time my share of work, and have always felt the only way of getting through it was to do the work of the day *in* the day, and even, if possible, to anticipate it. If a man, and especially a young man, tells me he has so many duties, and so much to do he can't keep pace with them, I would take the liberty of saying to him—

> A little less indulgence in the bed,
> A little more arrangement in the head,
> A little more devotion in the mind,
> Would quite prevent your being so behind.

May I not then say, that a man who is placed upon a farm suited to his means, his capital, and his ability, under a good landlord, promising fixedness of tenure, with a comfortable house and suitable offices for the conduct of his business, is a privileged man? and while he reflects upon his privileges, let him not forget to think upon his duties. I would say to him as I would say to every man—

> Do all the good you can,
> In all the ways you can,
> At all the times you can,
> As long as ever you can.

My friends, I believe it is every man's duty, whatever his position in society, to make his own home as happy, as comfortable, and as pleasant as possible."

Now, if Mr. Beasley had been addressing the lads of his village school, all this, or some of it at least, might have been well enough; but surely it is scarcely up to the calibre of a meeting of Berkshire yeomen, for whose especial benefit the lecture was delivered. "Never defer till to-morrow what you can do to-day"—"A little less indulgence in bed"—and "Do all the good you can"—are sentiments that no one, we trust, can quarrel with. But did they need such grave emphasis here? Beyond this, however, it appears that a tenant who has a farm up to his capital, with some security of tenure, and a comfortable homestead, is a privileged person! What the exact interpretation of "a privileged person" really is we will not undertake to say. In common parlance it generally means a gentleman who is permitted to play practical jokes, or be late for dinner, or take a little too much wine, or do something or other rather out of the way, simply because he is a privileged person. Is the farmer with sufficient capital and proper tenure to claim such privileges on such a showing? Or, is not the landlord who duly receives his rent and sees his property is done full justice to quite as much a "privileged man" as the other? Mr. Beasley has a becoming respect for the landlords of England, and he sagaciously advises the young farmer to hold under none but a good one. Surely, though, not on these terms?—"I know one large estate, where the average holdings of all the tenants, paying fifty pounds a-year and upwards, are more than ninety years; and upon this estate there are no leases or agreements, and never have been. Look out, then, for a good landlord; and, if you are fortunate enough to live under one, take care you set a proper value upon him." If this example be worth anything at all, it would tend to show that, providing a man has a good landlord, he needs neither lease nor agreement. Of course this could not be "business." On the contrary, it would be and is sheer folly. Who is to insure another good landlord when this one meets the common lot? Who to guarantee the same fair terms, or even continued possession, to the tenant who has neither lease nor agreement? But this is an old story; and we are sorry to see Mr. Beasley go out of his way to revive it. This illustration here of a good landlord, if it have any value, is like that of the buoy on the coast—more to avoid than attract. Let people be ever so good, let them have the finest sympathies and warmest likings for each other, they cannot have too clear an understanding of how they mean to go on with each other. Let them, as the homely phrase says, "put it in black and white," and they are safe and sure. Without it, why sympathy and philanthropy and high-mindedness may fly away with a cock-pheasant, or look blue or turn yellow at an election for the Shire.

By far the best thing in the whole pamphlet is the story, well told and well pointed, of how the famous Bakewell of Dishley got his friend out of a difficulty. It is rather long to extract; but as our quotations, so far, have not been very favourable, we are in justice bound to give it:—

"On one occasion an old friend went to pay him a visit, for the purpose of explaining to him his position, and at the same time begging that he would recommend him what to do. He had lived all his life upon his own farm of one thousand acres; he lived very well, but he had never saved a shilling. He had three daughters, and the eldest was about to be married; he highly approved of the match, but the intended husband expected some portion, and he had nothing to give him. Should he mortgage his estate, or what should he do? Mr. Bakewell begged of him to spend the night with him, and promised the next morning to give him the result of his cogitations. Accordingly, the next morning, when they met at breakfast, Bakewell said, 'I have made up my mind what you ought to do; give your son-in-law one-fourth of the farm, keep the remaining three-fourths, and do not part with any portion of your capital and stock, and work the remaining three-fourths with it. Do it better than you have hitherto done, and your income will be rather increased than diminished.' His friend followed his advice; but at the end of two or three years, another daughter would be married, and the perplexed father again resorted to his friend Bakewell for advice, under this new difficulty. Bakewell coolly said, he had watched his proceedings, and seen their results; he must do in this case as he had done before, he must give up another fourth of his farm, and keep the original capital and stock. The father seemed somewhat puzzled, but as the first experiment had succeeded, he determined to try it in this case also. Last of all the youngest daughter was to be married, and, in utter despair, the poor father paid another visit to Dishley to explain his perplexity. 'Well,' said Bakewell, 'tell me honestly whether your income has diminished by having reduced your farm by one-half.' The father acknowledged he thought it had not. 'Then,' said Bakewell, 'you must give up another fourth of your farm, and keep your house and the remaining 250 acres for yourself, and, to tell you the truth, you will then have just such a farm as your stock, your capital, and your head are fit for, and will be a better and happier man than ever.' Old Bakewell used to tell the story with great glee, and declared his friend left as much stock and capital upon the 250 acres as he had ever had upon the 1,000, and, as he believed, made a better income out of it."

We wish the rest of the paper was equal to this. But in plain truth it is not. We allow Mr. Beasley every credit for good intention and moral purpose. His address, however, is vague and abounding in generalities that can make little or no permanent impression. He has been only too careful not to give the least possible chagrin or alarm to anyone, and he becomes in proportion ineffective as he is inoffensive. From such a man the world expected some far more decisive dicta on the several duties of landlords and occupiers. We would echo his own words to him, and counsel him the next time he addresses an agricultural audience to speak out a little more freely, to avoid "commonplaces," however excellent they may be, and to take as his motto more "Attention to details."

REPORT OF EXPERIMENTS WITH DIFFERENT MANURES, ON PERMANENT MEADOW-LAND;

with Tabular Appendix.

By J. B. Lawes, F.R.S., F.C.S., and Dr. J. H. Gilbert, F.C.S. From the "Journal of the Royal Agricultural Society," Vol. xix., Part 2, and Vol. xx., parts 1 and 2.

(London: printed by W. Clowes and Sons, Stamford street and Charing-cross.)

There are no better or more useful friends to agriculture than the men who institute experiments such as those recorded in this volume. To the grazier they will prove invaluable, by showing not only what manures are beneficial to pasture-lands, but what are adapted to the production of the most nutritive plants, which spontaneously take the place of the extirpated weeds. By following up the experiments of these ingenious and persevering *savans*, you may promote the growth either of graminaceous or leguminous vegetation, there being a species of manure adapted to either. Complex as the herbage of a pasture or meadow is, it is important that those plants which afford the most nourishment should predominate, and, above all, that promiscuous or useless weeds should be exterminated. The increase of the former is sure to decrease in an equal proportion, if not entirely destroy, the latter. The importance, therefore, of the Rothamsted Park experiments and their results, as set forth at large in this book, cannot be over-estimated.

THE LARCH DISEASE, AND THE PRESENT CONDITION OF THE LARCH PLANTATIONS IN GREAT BRITAIN.

By Charles McIntosh, Garden Architect, Landscape Gardener, &c., &c.

(William Blackwood & Sons, Edinburgh and London. 1860.)

Can it indeed be true that a forest tree that has been acclimated for a century in the United Kingdom, and especially on the high grounds of Scotland, which approximate so near to its native climate, is destined to become extinct? We should deeply regret that this, the most elegant of the Coniferæ, should be subject to such a fate; and we are glad to find that the author of the work before us rejects the idea, and imputes the decay of this useful tree to the change of soil at its original introduction, from the Alpine heights of Switzerland to the rich soil and murky climate of Wimbledon, where they were first raised in this country, and from whence the stock was distributed over the kingdom. It certainly is a remarkable fact, that of the estimated number of twenty-eight millions of larches planted by four landowners in Scotland within a century, not fifty remain alive, although its natural term of life is from 150 to 200 years in its native country. This extinction of the larch in less than half its natural time certainly indicates something wrong in either the soil, climate, or treatment. Among the nine causes to which the author ascribes the mischief, six are placed to the account of treatment, and the other three to injury done by game and cattle, the attacks of insects, and accidental misfortunes. The subject is important, as no other timber tree is so well adapted for sleepers on railways as the larch. Mr. McIntosh mentions, some properties in Scotland, on which the loss will probably amount to from £10,000 to £20,000, if the disease is not arrested.

HAND-BOOK OF THE MECHANICAL ARTS CONCERNED IN THE CONSTRUCTION AND ARRANGEMENT OF DWELLING-HOUSES AND OTHER BUILDINGS, WITH PRACTICAL HINTS ON ROAD-MAKING AND THE INCLOSING OF LAND.

By R. S. Burn, Engineer, one of the Authors of the "Book of Farm Implements and Machines," and Author of "Dwellings for the Working-classes." Second edition.

(W. Blackwood & Sons, Edinburgh and London. 1860.)

Mr. Burn has done good service to those of his own profession, as well as to proprietors and managers of estates, by the production of this work, which comprises valuable information on everything relating to the erection of dwelling-houses, from a shanty in the Backwoods to an Italian villa, of the cost of which latter a specification is given. The illustrations which are very numerous, consist of drawings of every section of a dwelling-house and farm-buildings, &c., with valuable hints upon practical mechanism, carpentry, well-sinking, &c. The work having reached a second edition, is proof of the estimation in which it is held by the public.

FARMING ECONOMIES,

No. 1.—GARRETT'S HORSE-HOE,

Sir,—Instead of wasting our time by the mere personal discussion whether Mr. Mechi is a good or bad farmer, making or losing money, let us see how we can diminish the expense and increase the profit of everybody's farming. In my Agricultural Catechism I ask (Question No. 24): Do you use Garrett's horse-hoe for your corn and root crops? Answer: Yes. Nine farmers out of ten would answer No; and I now want to convince them that that word is to them an expensive negative, causing them a diminution of their farming profits. Let me illustrate it.

This is a late season, and a sudden favourable change may naturally be expected to cause a rush of vegetation, and an impossibility of cleaning the corn crops by hand-hoeing. Last week being so dry and suitable for weed-killing, I stimulated my horse man to do extra hoeing. Having only one Garrett's hoe, my man put on a pair of horses in the first half, and a fresh pair in the second half of a long day, say from sunrise to sunset, and in that one day clean horse-hoed 21 acres of wheat on stiff clay. I gave him extra pay for his overtime:—

Two pair of horses	£0	9	0
Ploughman	0	2	0
Do. extra time	0	1	0
Wear and tear of hoes and implements, and interest on ditto ..	0	2	0
	£0	14	0

The 21 acres were thus well and deeply horse-hoed for 8d. per acre. Unless pressed for time and opportunity, a man with one pair of horses usually horse-hoes from 8 to 10 acres per day of either wheat, beans, mangel, or turnips, at a cost of 1s. per acre. In the case of root crops, the hoeing is almost as deep and efficient as the ploughing. Different hoes are used for root crops. The lines of wheat are picked over by hand-labour. It is essential to use the horse-hoe before the spring fibres of the wheat push into the spaces, or they would be injured by the hoes. Garrett's horse-hoe covers a space of 7 feet 2 inches. I have used this horse-hoe for 16 years.

May 7. J. Mechi.

P.S. May 14.—As I anticipated, the splendid rain of the 12th inst. has rendered weed killing a much more expensive and difficult operation.

HADLEIGH FARMERS' CLUB.

This Club celebrated its anniversary meeting on May 18. The show of stock was a good one, but scarcely so large as in some former years. The horse stock maintained the reputation which Suffolk has earned in this department. The prize bull (Mr. T. Partridge's, Oldham Hall) was a very fine shorthorn. The pure Suffolk cows attracted a good deal of notice; and the Southdown sheep were good. The judges were Mr. Cooper Clarke, of Tattingstone; Mr. S. King, of Preston; and Mr. R. Scott, of Lavenham. The prizes were awarded as follows: For best stallion for general purposes, Mr. W. Stearn, Elmsett; best brood mare, Mr. W. Strutt, Groton; best gelding, Mr. S. B. White, Bildeston; second best ditto, Mr. J. Gentry, Washbrook; best gast mare, Messrs. R. and J. Rand; best colt under 27 months, Messrs. R. and J. Rand; best gelding under 27 months, Mr. J. P. Everett, Hadleigh; best filly (a good class), executors of the late Mrs. Everett; best colt or gelding under 15 months, Mr. R. Sheldrake, Kersey; best filly under 15 months, executors of the late Mrs. Everett; best foal, Mr. W. Kersey; best bull, Mr. T. Partridge, Oldham Hall; best Suffolk cow, Mr. J. Everett, Washbrook (Mr. S. O. Kersey's cow highly commended); best cow of another breed, Mr. W. Grimwade, Hadleigh; best fat steer Mr. S. B. White, Bildeston; second best, Mr. J. G. Stow, Boxford; best shearling Southdown tup, and best Southdown tup of any age, Mr. T. Hawkins, Bentley; best shearling longwool tup, Mr. E. Cook, Holton; best longwool tup of any age, Mr. G. F. Parson, Waldingfield; best pen of five Southdown ewe hoggets, Mr. T. Hawkins; best pen of Suffolk down ewe hoggets, Mr. J. G. Stow, Boxford; best pen of wether and ewe hoggets of any shortwool breed, Messrs. R. and J. Rand; best pen of pure-bred longwool ewe hoggets, and long wool cross-bred ewe and wether hoggets, Mr. E. Cook; best fleece of hogget short wool, Messrs. R. and J. Rand; best fleece of hogget long wool, Mr. E. Cook; best boar; Mr. T. Partridge; and best and second-best breeding sow, Mr. J. Everett.

Sir Charles Rowley presided at the dinner, which took place at the Town Hall. Major Parker, M.P., in referring to malt-tax question, expressed his cordial concurrence in the movement for repeal, and argued that farmers ought to be relieved of some of the burdens pressing upon them. Mr. Joseph Rand, in responding to the toast of his health, made some practical observations on the early sale of stock. Lately, he observed, the aim of graziers had been to bring stock to early maturity. Formerly, a sheep was never sold under three years of age; but now, hoggets were disposed of a year younger; the consequence was, we were losing in the number of head, and meats would soon be considerably dearer. Mr. W. Gurdon followed with some observations on pleuro-pneumonia and the growth of mangel wurzel, to which we propose to refer next week.

SHOW OF FAT STOCK AT POISSY.

The annual exhibition of fat cattle, sheep, and pigs, was held at Poissy during the first week of April. The address, delivered by the Minister of Agriculture, M. Rouher, contains several references to the commercial treaty between France and England. The Minister pointed out the advantages to French agriculture which might be expected to result from the freer intercourse between the two countries, and the lowering of the duties on articles of export and import.

The Judges were in two sections, one section awarding the prizes in the cattle classes, the other in the sheep and pig classes.

The number of animals exhibited is in excess of that of previous years. Compared with that of 1859, the increase is considerable, particularly in the entries of sheep, the increase being 140. There was a falling-off in the entry of pigs. The following shows the numbers of the respective years:—

	1859.	1860.
Oxen	257	281
Calves	11	11
Sheep	310	450
Swine	89	78
	667	820

The age of the cattle competing is a remarkable feature of the exhibition. Doubtless, many of the aged animals had been used in the yoke:—

122 oxen were under 4 years.
34 between 4 and 5 years.
67 between 5 and 6 years.
46 between 6 and 7 years.
5 between 7 and 8 years.
7 between 8 and 9 years.

The animals are classed according to the territorial division from which they come, and not according to breed, France being divided into seven districts, each district embracing several departments (counties). There are seven divisions corresponding to the region from which the cattle came, and in each division the animals are divided into three categories according to age and breed. In the first category animals under a certain age and without regard to breed compete. In the second category animals of French breed, but of above a certain age, compete; and in the third category animals above a certain age, but without distinction as to breed, compete.

The prize of honour for the best animal in all the classes was awarded to an ox, Shorthorn-Swiss, age 36 months, live weight 2,070lbs., bred and fed by the Prince of Wagram, at

Grosbois (Seine-et-Oise). The prize of honour is a piece of silver, value £105. This in addition to the first prize awarded to the ox in his class—about £60.

In the classes for sheep the prize of honour was awarded to a pen of Southdowns, age 13 months; gross live weight 1,705 lbs., belonging to Viscount Charles de Bouille, Villars (Nevre). Sheep are shown out of the fleece. The Southdown flock at Villars was formed in 1855. The flock originally purchased from Mr. Jonas Webb, Babraham, Cambridgeshire. Value of the cup of honour £65.

In the classes for swine the prize of honour was awarded to a pig, New Leicester, age 10 months 5 days; live weight 312 lbs., belonging to M. de la Valette of Villiers-Charlemagne (Mayenne).

The exhibitions of fat stock in the local departments have also been successful, viz., at Bordeaux, Nantes, Nimes Lyons, and Lille. These exhibitions are all under Government management, the National Exchequer furnishing the funds for the prizes, &c.—Abridged from the *North British Agriculturist.*

CALENDAR OF AGRICULTURE.

Swedish turnips may be sown till the tenth of this month, and all common turnips till the twenty-fifth. The land must be well reduced and pulverized, thoroughly cleansed from all weeds and stones, and rolled flat. Drills are opened by the double mould-board, or by the common plough, the dung spread along the intervals, and the seed sown on the reversed drills of fresh soil. Auxiliary manures, as bones and guano, are deposited by machines which split the drills with coulters into ruts that receive the dung and seed over it in the fresh tilth. A light rolling of the drills is required, chiefly on cloddy crumbling soils, in order to crush the small clods, and to close the surface against drought, and to hold moisture as with a lock and key. In dry seasons this rolling is a most useful part of turnip farming. Turnip sowing is generally finished during this month.

In the end of the month plough, with a thin furrow, the lands that have been pared and burned, and on which the ashes are spread; harrow the surface into a fine tilth, roll it if cloddy, sow the seeds in broadcast by hand, and cover with a line of harrowing, and roll again if clods are present. If the lands are deep and loamy, work and drill the land as usual.

Plough the intervals of the drills; horse and hand-hoe potatoes, beet, parsnips, and carrots, and plough potatoes deeply, and break the drills very carefully with the handhoe. Plough lands on which winter tares have been consumed, harrow the surface finely, and sow the turnip seed with bones or guano in ruts made by the coulters of a machine. A light rolling may be required.

Shear sheep, and mark by distinction the different ages and conditions. Wean the lambs of the year, place them on the best pastures. Put mares to the stallion every fortnight.

Cut and destroy all weeds on pastures, pull all tall weeds among grain crops, and destroy all weeds on the sides of roads, ditches, and hedges.

Hay harvest will sometimes commence during this month in early seasons. Clovers, sainfoins, and early meadows are first cut; get the crop dried and stack it quickly. Allow six haymakers to one mower, besides the carrying process. Cut the grass quickly behind the mowers, spread it thinly with Smith and Ashby's machine, place it in cocks, spread it again, and in three or four days it may be carried and built in a rick or stack. Turn clovers in the swathe, and gently, in order to preserve the leaves. Place the newly made hay on the stack to consolidate by its own weight, and not by treading as is usually done. Salt may be sprinkled among hay when partially damaged.

Continue to feed in the yards with clovers and vetches the workhorses and the milch cows over night: provide ample litter in order to produce manure.

CALENDAR OF GARDENING.

Kitchen Garden.

In the first week sow early peas, kidney beans, and runners for succession, cabbages to come in quickly, Dutch turnips for autumn, carrots and onions to draw young or stand the winter.

In the fourth week sow again turnips, salads, and lettuces.

Transplant Cape broccoli about the middle of the month, cauliflower for August, making the ground rich with compost; also transplant broccoli, Jerusalem and Scotch kale, savoy, and Brussels sprouts.

Asparagus beds still yield, but should be cut beyond the 10th, leaving untouched a shoot to each crown, and scattering fine compost over the beds.

Plant thyme, savoy, sweet marjoram, basil, and slips of rue, lavender, and rosemary, and other sweet herbs in cool shady beds for subsequent transplantation. Cut aromatic herbs for being dried when they begin to show flower. Thin out onions by degrees for use, leaving the bulbs to stand in four to six inches asunder: gradual thinnings prevent the effects of drought.

Fruit Garden.

Strawberry beds should be stringed on each side, the twine fastened to short sticks, so as to support the entire rank of trusses.

Arrange in proper order the green plants in pots and all flowering shrubs: take up bulbs when the green parts change colour and become dry.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR MAY.

During the early part of the month, serious apprehensions, owing to the unusually backward state of vegetation in all parts of the United Kingdom, and the great scarcity of food in our grazing districts, were felt in reference to the ultimate fate of live stock, both beasts and sheep. The advices at hand from Scotland and different parts of England, stating that severe losses had been experienced, and that the graziers were compelled to dispose of their stock in a half-fat state, induced the opinion that, within a brief period, prices would rule ruinously high to the consumers. A sudden and most beneficial change having taken place in the atmosphere, and a full average quantity of rain having fallen, with the wind mostly blowing from the southward and westward, the supply of grass in the pastures rapidly increased, stock was withheld from the various markets, and trade became in an excited state. The result is, that the quotations of both beasts and sheep have risen higher than has been known during the last thirty years, and the utmost difficulty has been experienced in obtaining adequate supplies of meat for consumption in the metropolis and elsewhere at any price.

The accounts which have reached us from most quarters on the subject of the wheat crop are not of so favourable a character as could be wished. It is quite true that, during the past fortnight, the plants have taken a rapid start, and that they have greatly improved in appearance; but we learn with regret that they are by no means so thick upon the ground as to warrant us in assuming that there are indications of a full average yield. These accounts, added to the enormous consumption going on, and the comparatively limited supplies at hand from abroad, have had their accustomed influence upon the wheat trade. Notwithstanding that, it has not been to say very brisk, prices have steadily advanced, and the previous decline in them has been recovered. The present state of the demand, and the small stocks of foreign held by the importers, led to much discussion in reference to the probable range in future prices. Much, of course, will depend upon the quantity of wheat in the hands of the home-growers, and, consequently, their ability to meet the demands of the millers between this and the commencement of harvest work. It must, we think, be admitted, that the produce of the crop last year was a very moderate one, both as to quantity and quality. The growth of straw was, however, the largest ever known; hence, apparently, full average quantities of wheat are still held. We believe, however, that the produce of the flail and thrashing machine during the next three or four months will prove a source of disappointment to the growers, from the disproportion in the supply of straw to the actual quantity of wheat in stack. It follows, therefore, that wheat is not likely to recede much in value for some time, and that it will be necessary to import largely in order to keep prices in check. Although it is stated, on what may be called good authority, that the Baltic, as well as the south of Russia, will furnish their usual supplies of grain, it may be doubted, owing to the comparative scarcity of shipping and the prevailing high rates, whether they will reach us in large quantities until a somewhat later period than usual. Under these circumstances we may safely assume that wheat has seen its lowest range of value for some time. In reference to barley, we may state that the supplies on hand are almost wholly exhausted, and that we shall be dependent upon the foreigner for such quantities as may be required for consumption. During the whole of the malting season—now closed—all kinds have been selling at very high quotations; indeed, more money has been realized for this particular kind of produce than in most previous years; and we believe that, had it not been for the extensive growth in Scotland last year, the quotations would have ranged even considerably higher, notwithstanding the extent of the importations from the continent. For oats, which have come slowly to hand, the demand has ruled active, at further advanced rates, and the value of both beans and peas has been well supported. All spring corn, in fact, has been disposed of at rates considerably above the value of wheat in a comparative sense, as regards actual market quotations. Flour has produced more money, and present quotations may lead to steady shipments of that article both from France and the United States. We believe, however, that there is no reason to anticipate what may be termed heavy importations from those quarters.

The public sales of colonial wool held during the month have been numerously attended both by home and continental buyers. They opened somewhat heavily, at ½d. to 1½d. per lb. less money, compared with the rates of the previous series; but prices have since shown a hardening tendency, and the whole of the parcels offered to the present time have changed hands. It is supposed that nearly 90,000 bales, including all descriptions, will be brought forward, since it is announced that the sales will not close before the 2nd of June. The removal of the duties on imports of wool into France has, no doubt, imparted more firmness to the sales than would otherwise have been the case, and that removal has led to the purchase of nearly 20,000 bales on continental account. For English wool there has been an improved demand, at prices fully equal to the previous month. The supplies held by our manufacturers are still very moderate, and complaints are general that manufactured fabrics continue to be disposed of at quotations which leave an unusually small margin of profit. Trade, however, is certainly in a flourishing state; our exports continue on an extensive scale, and nearly the whole of the mills are running full time. The latest advices from Australia bring rather lower prices for wool, owing to a falling-off in the speculative demand, and to the increased quantities coming forward.

For hay and straw, arising from the backward state of the season, there has been an active demand, and, at one period during the month, high prices were realized for both meadow and clover hay; the former having realized £3 to £5 5s., the latter £4 to £6 6s. per load. The present quotations rule thus:—Meadow hay, £3 to £4 17s.; clover, £4 to £5 17s.; straw is quoted at £1 6s. to £1 13s. per load.

The hop trade, though steady, has been in an unsatisfactory state. No change of importance has taken place in the quotations, the plantation accounts have been tolerably favourable, and the duty has been done at £140,000. The supplies of English hops on hand are still large; but we have had scarcely any importations from the continent.

Potatoes have come to hand somewhat freely from Scotland, in, for the most part, good saleable condition; but the Metropolitan markets have been very scantily supplied with those grown in England. At this time last year the best qualities were selling at 200s.; now they are worth 180s. per ton. Apparently, therefore—and we must bear in mind that we have drawn very limited supplies both from Ireland and the continent since the beginning of the year—the produce in 1859 was somewhat in excess of estimates published in the early part of the season.

There has been a steady, but by no means active, demand for wheat in most of the Scotch markets—which, generally speaking, have been fairly supplied—at about stationary prices. The small quantities of spring corn on offer have changed hands freely at extreme rates. The shipments of grain to the south have exhibited a considerable falling off.

Only limited supplies of wheat have been on offer in most of the markets held in Ireland, and most descriptions have changed hands steadily at full quotations. Barley, oats, and other articles have commanded extreme rates. The few potatoes brought forward have realized high currencies, and the stocks appear to have been almost wholly disposed of.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Never in the course of our long experience do we recollect so much general excitement in the cattle trade as during the month just concluded. Notwithstanding that we have imported stock from the Continent somewhat liberally, and that the actual numbers of English shown in the Metropolitan Market have been moderately good, the demand for both beasts and sheep has been active in the extreme, and a most extraordinary rise has taken place in their value. The present position of the trade is a matter calling for more than ordinary observation. We have observed that moderate supplies of stock have been on show; but it is necessary to state that at least three-fourths of them have come to hand in a half fat state. These remarks apply to the arrivals from our own grazing districts, as well as from the Continent. When it is considered that the season has been a most backward one, that there has been a great scarcity of food in nearly all parts of the kingdom, and that many of the graziers and flock-masters have consequently been compelled to dispose of their stock at an earlier period than usual, the deficiency of weight is the more readily understood; but we must all regret that it has been found necessary prematurely to dispose of either beasts or sheep, which in a few months would become valuable to the butchers. The important and highly-beneficial change in the weather about the middle of the month, and the rapid growth of grass in the pastures, compelled the owners of stock to withhold their usual amount of supply to keep down a sudden abundance of pasture food, and speculators found it a matter of no ordinary difficulty to buy up stock for London at any price. Those who usually slaughter large numbers of beasts and sheep for transmission to Newgate and Leadenhall markets were compelled wholly to suspend their operations, and hence, at one time, the wants of the consuming classes could not be met, and it is a remarkable, certainly a novel, fact in these days, that the quantity of meat actually sold in London during the past fortnight has been less by fully *one-half* that usually consumed in it at this period of the year! Live beasts have realized as much as 5s. 6d., and Down sheep, out of the wool, 6s. 6d. per 8 lbs.! These quotations are the highest paid during the last thirty years, and the grave questions have been mooted—first, Is there a serious deficiency of stock in the country? and, secondly, How long is the present state of things to continue? It may, we think, be taken as an ascertained fact that great inroads have of late years been made in the available supplies of both beasts and sheep, and that those now remaining are far beneath the actual wants of the country. In many previous years we have written against, certainly we have condemned, the system of in-and-in breeding to some extent; but, at the same time, we have supported judicious crossing. Has, then, the former system produced a deficiency in the supply of food, and has the latter tended in the same direction? These are important, nay most serious, matters for reflection at a moment like the present, when England is almost threatened with a great scarcity of animal food. The in-and-in system has, we have very little hesitation in saying, *checked* the necessary increase in the production of live stock, taking our enormously increased consumption into consideration. But this falling off in the production has possibly been chiefly made good by the new system of crossing; in other words, we believe that the crosses between the Scots and Shorthorns have yielded as much really consumable meat as the in and-in system so much in vogue amongst the breeders of sheep has decreased the supply of mutton. Here let us observe that the falling off in the supplies of fat stock has not been confined to London alone, because the Metropolitan Market has been visited by large buyers from the north of England, and even from Ireland; but who, mostly, have been unable to obtain either beasts or sheep without actual loss on re-sales. Again, not a single head of stock has arrived from Ireland, and only 94 beasts have come to hand from Scotland, against 2,000 head in the corresponding period last year. There is certainly no parallel from which we can draw any definite conclusion regarding the trade of the month, and it would seem, from all that we can learn, that very high prices will rule for stock—though the present enhanced rates can scarcely be supported, since it is evident that high quotations must check consumption—during nearly the whole of the year. Present rates, however, will no doubt induce large importations from the Continent, as well as from Spain and Portugal; but unless they are of an improved quality, viz., unless they come to hand in more saleable condition, the effect upon prices will not be of an important character. We may observe, however, that in some measure the quotations will be governed by the state of the tallow market, consequently by the value of rough fat, which article, during several months past, has been selling at enormously high rates, viz., 3s. 1½d. and 2s. 8½d. per 8lbs., the latter being the present currency. The in-and-in system in sheep-breeding has, we are all aware, been productive of what may be termed a systematic forcing of sheep for the purposes of the butcher. This system has yielded an enormous quantity of fat, but a comparatively small quantity of meat; in other words, it has furnished stock of premature ripeness, and to some extent destroyed the future numerical strength of our supplies. On this point there can be no doubt; but how can we alter a widely prevailing system, which, in a national point of view, is dangerous in its tendencies? The graziers contend that to keep sheep longer on the land than is absolutely necessary would be attended with danger to their pecuniary interests. To some extent this may be perfectly true; still it has become a most important matter for inquiry how far we are drifting in a wrong direction, considering our enormous consumption. That the supplies of both beasts and sheep in the United Kingdom are now smaller than they have been for many years past is fully apparent to all persons connected with the breeding and feeding of stock. We may, therefore, import largely from the Continent; but our opinion is, that there is no reason to anticipate any important reduction in present prices. No doubt we shall have tallow at a much lower range than it now is, owing to the large supplies anticipated from Russia—138,000 casks—but our impression is, that breeding must long continue a source of considerable profit to those engaged in it.

The annexed return shows the total imports of foreign stock into London during the month:—

	HEAD.
Beasts	1,633
Sheep	15,023
Lambs	189
Calves	1,253
Pigs	802
Total	18,900
Same time in 1859	10,718
„ 1858	6,703
„ 1857	7,243
„ 1856	3,556
„ 1855	7,103
„ 1854	4,703
„ 1853	13,007
„ 1852	8,506

The above comparison shows that we imported a large number of foreign stock last month; but out of the 15,000 sheep at hand nearly 13,000 of them were composed of Merinos bred in Germany, and which have arrived in miserably poor condition, consequently they have added very little to our supplies of food.

The total supplies of home and foreign stock shown in the Metropolitan Market in the month were as follows:

	HEAD.
Beasts..	19,040
Cows	543
Sheep and lambs	124,580
Calves..	2,059
Pigs	2,950

COMPARISON OF SUPPLIES.

May.	Beasts.	Cows.	Sheep&Lambs.	Calves.	Pigs.
1859......	17,980	482	113,512	1,012	2,260
1858......	18,722	480	115,886	1,671	2,760
1857......	18,995	450	104,990	1,415	2,530
1856......	18,741	495	119,640	1,260	2,545
1855......	19,847	410	113,600	2,470	2,590
1854.. ...	20,831	576	124,824	2,146	2,435

The arrivals of beasts from Norfolk, Suffolk, Essex, and Cambridgeshire have amounted to 11,000 Scots, Shorthorns, and crosses; from other parts of England, 4,800 various breeds; and from Scotland, 94 Scots and crosses.

Beef has sold at from 3s. 6d. to 5s. 6d.; mutton, 4s. to 6s. 6d.; lamb, 5s. 8d. to 8s.; veal, 4s. 4d. to 6s. 6d.; and pork, 4s. to 5s. 4d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	May, 1856.						May, 1857.				
	s.	d.		s.	d.		s.	d.		s.	d.
Beef, from..........	3	0	to	4	10	...	3	0	to	5	0
Mutton	3	6		5	4	....	3	4		5	4
Lamb..............	5	4		6	6	....	5	6		7	0
Veal	3	10		5	6	....	3	8		6	0
Pork	3	4		4	8	....	3	8		5	0

	May, 1858.						May, 1859.				
	s.	d.		s.	d.		s.	d.		s.	d.
Beef, from..........	3	0	to	4	6	....	3	4	to	4	10
Mutton	3	2		4	6	....	3	6		5	0
Lamb..............	5	8		7	0	....	5	4		6	4
Veal	4	0		5	4	....	4	0		5	6
Pork	3	2		4	4	....	3	2		4	2

Very limited supplies of meat have been on offer in Newgate and Leadenhall markets. Trade generally has been very active.

Beef has sold at from 3s. 4d. to 4s. 8d.; Mutton, 3s. 8d. to 6s.; Lamb, 5s. 8d. to 7s. 2d.; Veal, 4s. to 5s. 4d.; Pork, 4s. to 5s. 4d., per 8lbs. by the carcase.

ISLE OF ELY.

Very great changes have occurred in the character of the weather since our last report was written: we then predicted that we were again on the eve of a return to cold, and so it proved. We continued to have frosty mornings, frequently with ice, with bitterly cold north-east winds for nearly three weeks. This weather told seriously upon vegetation. On the 18th April we had a terrific gale of wind from the north-east, which threatened to be very destructive to many of the crops in our fen districts. The dust was blowing in clouds in all directions from the land. Newly-sown oats were threatened with entire destruction, and, doubtless, many were seriously injured. The wheats, too, on light, weak soils, sustained considerable injury. On the morning of the 7th instant we had one of the sharpest frosts we had experienced all the spring; the ice was quite thick. On the few days previously, as also on the day immediately succeeding it, we had a good deal of brilliant sunshine, and we always find bright days, with a high temperature before and after a severe frost in the spring, tend to make it much more destructive to vegetation on our fen lands, and in this particular instance our previously-formed opinions received a full confirmation. This one night, followed by a sunny day, did more mischief to our fen wheats than all the adverse weather of the long and protracted winter had done. The flag and stem were cut, and in many instances looked quite white in colour, and lay upon the ground in all directions, smelling almost like hay-fields. Happily, this weather did not continue, but was immediately succeeded by a freedom from cold frosts at nights, and in a few days by a magnificent rain, which has thoroughly saturated every inch of ground. On Saturday, the 12th instant, the rain began to fall about 8 p.m., and continued, without intermission, till 4 p.m. on the following day (20 hours). During the whole of last week, too, we had copious showers, and on Tuesday we had a very severe thunderstorm, when the rain fell in torrents, and our farmers were beginning to fear that an excess of moisture would be realised; but the clouds have been dispersed, and again we have brilliant weather, and vegetation is making rapid progress. Our crops are generally recovering, and presenting a more promising appearance. The wireworm is rather busy on some of the oat lands, and is thinning the plant a good deal in some instances. Mangold seeding was scarcely finished when the rain fell, and has consequently been suspended for a week. The pastures are in their very best attire, and present a most beautiful aspect. Shortness of keeping will not be again a complaint for many a day. Our prospect for hay is good, and crops must be heavy. Both bullocks and sheep sell more freely at considerably better prices. The opinion we ventured to offer in our two last reports as to the sale of sheep when the grass season had arrived, appears likely now to be confirmed by fact. Prices are pointing upwards, and will, ere long, we conceive, be extravagantly high. The corn trade progresses slowly, but is slightly dearer, and we still anticipate higher prices.—YOUR FEN REPORTER.—*May 21st*, 1860.

ESSEX.

Throughout this county, as in most others, a great quantity of rain has fallen during the past fortnight, and especially so on Saturday the 12th inst., the effect of which was very apparent on the following day, as the water rose to an unusual high pitch, so as to inundate many acres of the low lands. The weather of the succeeding week was very wet and unsettled, accompanied with thunder; and again on Saturday last severe hailstorms, with a very cold westerly wind to follow. The present low state of temperature, succeeding as it does a superabundant fall of rain, has produced a most injurious effect upon the crops, and more especially so upon the wheat and barley generally, particularly upon the heavy lands of the Dengey Hundred district, as also throughout the Roothings, which should produce our best samples of barley, but which we fear will not come up to the mark this season, and certainly not in bulk. The light lands have suffered, but not to the extent of the heavier descriptions, and congenial weather to follow will act as a saving-clause. The oat and pulse crops look pretty well, but many pieces of winter beans have suffered, owing to the severity of the past inclement season. John Barleycorn undergoes a considerable amount of rough usage, even before his conversion to malt, whereby his vitality is destroyed; and as water is afterwards used to extract his strength, it appears to have something of the same injurious effect when in plant, as much rain always acts injuriously, and causes him to turn pale—a colour seldom to be desired, either in the vegetable or animal kingdom. The crops of grass and clover promise to be very heavy, as the weather has been most favourable to their growth, the wet not having set in till the frosts had nearly disappeared, and so late that they have caused little or no check. The wheat markets have made such rapid advances, and to such a high figure, that the like has not been known for many years past. The corn trade has been gradually improving, but still rules low; however, we hope that there are "good times coming."—May 28th.

WEST GLOUCESTERSHIRE.

Many months have elapsed since we could report favourably of agricultural productions. Not only have we entertained serious apprehensions of the wheat, but the pasture lands have presented a barren appearance, and the rick-yards became seriously exhausted to keep the stock alive. So great and gratifying a change as that which took place in a few days can scarcely ever be remembered, and would appear almost incredible, except to those who have carefully observed the benign influences of a bountiful Providence. Dry weather accompanied with occasionally hot sunny days inaugurated the month till the 8th, when slight showers refreshed the earth, giving an impetus to vegetation; and during the three following days warm rain descended in considerable quantities, since which the growth of every species of plant and herb has been most luxuriant. In our last communication we noticed how backward the spring was as compared with last year; but the most sanguine hopes could never have anticipated such rapid and gratifying progress as that which has taken place since then. Wheat is now looking fairly promising, and may, with a continuance of auspicious weather, be productive; and the other kinds of grain have improved in equal ratio. In nothing, however, is improvement more conspicuous than in the pastures, which throughout the extensive vale reaching from Gloucester to Bristol is of the utmost importance. Dairy-farmers were indeed at one time quite desponding. In many instances they have not a sufficient quantity of arable land to cultivate mangold: thus their only resource is in their hay, and there is a very large stock of cattle in the country. Instigated by the increasing value two years since, there is scarcely a farmer who has not reared more than his accustomed compliment. The past inclement winter and the late spring has therefore been more than usually perplexing, while many who would have been sellers could not find purchasers without making sacrifices. The dulness of the markets has, however, passed away now that keep is more abundant. The demand for cheese has enhanced its value, and as soon as made it finds ready purchasers. Stores of that article in factors' hands are but light, therefore any reduction in price can scarcely be expected. The show for fruit is enormous; such a blossom "the oldest inhabitant" never recollected. The appearance of the orchards, varied by the green foliage and pastures, is truly enchanting, and unless there comes some unhappy blight the quantity of that grateful beverage, cider, will be unusually extensive. Potato planting is completed, and there appears to be about an average quantity of land devoted to that purpose. With the exception of early ones they have escaped the influences of frost, and are so far promising. We need scarcely comment on the state of the markets, as they are so accurately chronicled; but the continued improvement in the value of wheat occasions some surprise, considering the more favourable appearance of the growing crop.—May 24.

HEREFORDSHIRE.

We believe we never recollect seeing this county look more lovely and promising than it does at the present moment. Nothing can be "kinder" than the blossoms on the apple and pear trees, and we hope there is now no fear of its suffering from the effects of the frost, as is the case in an early spring, which is accompanied usually by sharp nights in May. The gentle rains of last week have had a wonderful effect on the appearance of the country. The young wheats have quite uncovered themselves, and the grass crops will, though late, be, doubtless, heavy. We have had occasion to move about lately, and never do we recollect seeing so much good clover as we do this year. All this tends to rapidly lower the price of hay which has, in parts of this county, been fetching £7 and £8 per ton. At Ross fair fat stock sold well, but lean did not go off. At Hereford, on Saturday, there was an improved demand, owing to the favourable effects of the rain. Pigs are still high, but we may expect a reduction in small stores shortly. At the recent fairs good horses, as is usually the case, sold well, but inferior ones were a drug. Potatoes are looking exceedingly well, and great quantities have this year been planted. The barley and winter beans present a favourable appearance, and, indeed, whether it relates to the field or garden, we may sum all up by saying everything looks well.—*May* 22.

NORTH NORTHUMBERLAND.

Looking to what was notified in our last public letter (April 20th), we were then doomed to write, as for several previous months, under very gloomy auspices. Grass and vegetation seemed exhausted and lifeless. Nor did any genial atmospherical change visit our northern clime before May 10th, about noon; when the frosty element fairly yielded to genial, or nearly summer heat. Vegetation assumed a more pleasing hue, and the face of nature seemed as if awaking from a dream. Looking at our growing crops on the more favoured districts, spring corn has made good braird. Oats and barley assume a rich green, and promise favourably for a good return. Wheat, of which the breadth sown is much less than usual, is various—in exceptional cases a very rich full plant may be seen, while large breadths seem thin, and occasional patches very much destroyed by slug, larvæ, or wire-worm. In fact, the season for tillering seems to have gone by, and the plant draws up thin and spiky. Another month will determine the fate of this our principal grain crop, at least in appearance, for bulk, when we trust a more favourable report awaits us. Beans and peas (only a small breadth sown) promise well, with a full vigorous plant. Potatoes were planted extensively, and generally with land in good tilth; the earliest field varieties are making braird, weather being very favourable for progress. Mangold wurtzel has also been very liberally planted, and Swedish turnips sown to the full usual extent. Having only been visited with occasional showers, the loamy soils work dry and require extra team labour, particularly rolling and clod-crushing. On free soils the braird has been quick, and we hope the plant will outgrow the beetle, which was unusually disastrous last season. Owing to the great want of roots in early spring, young grasses were necessarily overstocked to keep the fleecy tribe from starvation, and many pastures remain very bare of feed. In sheltered and cultivated districts the fall of lambs will be less, but not much below our usual number, but we regret to say that over the hills and large pastoral occupations in this county, the loss is almost fabulous. While we write weather is warm and refreshing; still, great masses of snow linger in the gullies of the Cheviots. We believe there has been no season during the present century when provender, hay, and straw have been so nearly exhausted, or used up, and hand-feeding with artificials so extensively resorted to. As may be expected, store cattle and sheep have been put to graze in poor condition, and it may be several weeks before we can supply the fat markets in the usual way. Beef and mutton sell at exorbitant rates, and it cannot be taken advantage of by the ordinary farmer. Sales of farm-stock by auction have been numerous and well sold; while public old-established fairs have been badly attended; stiff slow selling markets.—May 25th.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ALCESTER FAIR was supplied equal to the demand, and prices generally were lower. Beef realized 7d. per lb., mutton 7d. to 7½d., pigs 35s. per head. Cows and calves and store stock maintained late rates.

BLYTH FAIR.—Oxen of all descriptions entered the village from all quarters in larger numbers than had been expected. High prices were asked, and a considerable amount of business was transacted. Prices ranged from 8s. 6d. to 9s. per stone. A pen of wether hoggs belonging to Mr. Jackson, of Brancroft, near Finningley, attracted much attention. He asked 80s. per head "naked." Colonel Mellish showed some pens of superior hoggs, as did also Mr. C. Hudson, 110 of which averaged £3 10s. clipped. There was a considerable number of young horses exhibited, and many were sold at good prices. Inferior animals, as usual, attracted no notice. The show of pigs was not large, and chiefly of the younger sorts, the prices varying from 20s. to 25s. each for those of nine or ten weeks old.

BODMIN FAIR.—The sheep fair was very scantily supplied. There was but one pen of fat sheep, which sold readily at 8½d. per lb.; the rest were store sheep of inferior quality. There was also a poor lot of lambs; the few in good condition sold freely at 8d. per lb. There was a very large supply of cattle. Good oxen and steers sold well, though the bargains were made slowly and cautiously. Some good cows sold readily at good prices. Cows and calves averaged 50s. per cwt. The supply of cattle was rather limited, and prices ranged from 60s. to 70s. per cwt.

CLAVERLEY FAIR.—The supply of beasts on offer was only moderate. A few prime things sold at extreme prices. Beef about 7d. to 7½d., mutton, in the wool, about 8½d. to 9½d. per lb. The average price of lambs was about £1 8s. to £1 9s. each. Store pigs sold very dear.

GLOUCESTER MONTHLY CATTLE MARKET.—The demand for all kind of meat was good, but the supply was very short. With the exception of beef, with which the market was well supplied, mutton and lamb were very scarce, and readily realized the following prices: Mutton 7d. to 8d., lamb 8½d. to 9d. per lb. The beef trade varied according to quality, from 6¼d. to 7¼d. per lb. The whole of the stock was very soon disposed of, and the market quite cleared.

HEREFORD FAIR.—The supply of stock was somewhat in excess of what we have been accustomed to see at this season of the year, and the attendance of dealers from a distance was also numerous. Fat beasts of every description were in urgent demand, and were eagerly bought for distant markets, at prices varying from 7d. to 7½d. per lb.; all animals of this class were purchased at an early hour, and many of them were sent to Manchester, Birmingham, and London, the same evening. Calves also sold readily at the same figure. The late genial rains, by clothing the pastures with luxuriant herbage, and generally giving an almost magical impetus to vegetation, added at least £1 per head to the value of lean stock; but still the supply was far in excess of the demand, and trade in this department ruled heavily, many lots being sent home unsold. Good milkers were in rather better demand. In the sheep market a good deal of briskness prevailed, and fat wethers were worth all the money they have lately realized, with a slight advance in a few cases; several sales were effected at 7½d. per lb., and many pens sold by hand realized prices equally advantageous. Fat lambs were worth about 8½d., and ewes with lambs were disposed of on terms rather more in favour of the seller than have lately prevailed. The pig trade was confined to sundry deals for stores, of which the supply was large, and which brought tolerably good prices. The horse fair presented a very lively appearance, but though there was no lack in point of numbers, good animals, for either road or field, were decidedly scarce, and in an overwhelming minority. The trade was generally very bad, and equine stock decidedly a drug, though there were inquiries for useful hacks at fair prices, and good draught horses commanded prices varying from £45, for three and four-year-olds, downwards.

HORSHAM FAIR was much larger than usual; and stock of all kinds, that were in a fit condition for the butcher, realized a very high price; and mutton, more particularly, was put up at an exorbitant figure. Trade with lean stock was altogether as dull throughout the day, and but very little business was effected.

KIDDERMINSTER FAIR.—There was a full supply of stock, and in good condition. Prices were a trifle lower than at recent sales, though some fresh barrens, nice weights, fetched good prices. Sheep were not so plentiful, and fetched 7¾d. to 8d. out of the wool. Horses numerous, and sales freely made.

LISKEARD FAIR.—There was but a small supply of fat bullocks, which sold at 65s. to 70s. per cwt. A limited number of fat sheep, 8d. to 8½d. per lb. A large supply of lambs, 18s. to 23s. each. Cows and calves 50s. to 53s. per cwt., store cattle 40s. to 50s. per cwt.

SHERBORNE FAIR was well attended by agriculturists and dealers. The supply of stock generally was small. The prices were as follows: Heifers and calves from £9 10s. to £12 10s., two-year old heifers £5 10s. to £7 10s. each, yearling heifers £5 10s. to £6 each, barreners 12s. to 18s. per score. There were but few sheep penned. Down couples from 38s. to 40s. per couple, Down hoggs 33s. to 35s. each, mutton from 8d. to 9d. per lb. There was a short supply of pigs: the best large stores fetched from 26s. to 28s. each, middle size from 18s. to 21s. each, small do. from 8s. 6d. to 12s. 6d. each, barren sows from 55s. to 62s. each.

SHREWSBURY FORTNIGHTLY MARKET.—Beef, which, considering the state of the season, was in as good supply as might be expected, realized from 7½d. to 8d., calves 6½d. per lb. Mutton: Supply not great—8½d. per lb. shorn, 10d. per lb. unshorn. Pigs in tolerable quantity; rates high. Good business done.

TOLLERDOWN FAIR was a brisk one, the demand for sheep, on account of the great change in the weather, and sudden supply of keep, being particularly good. Ewes, horns 44s. to 52s., Downs 28s. to 35s., couples 41s. to 48s. Some fat beasts were brought under the hammer, and knocked down at 12s. a score.

IRISH FAIRS.—At CASTLEPOLLARD fair there was a large attendance, and a sharp competition for all kinds of stock. Three-year-old heifers were quickly picked up, at prices varying from £11 to £15, dry cows £9 to £13; beef scarce, and sold at fully 8d. per lb. The supply of fat sheep was small, and fetched 7½d. to 8d. per lb., hoggets 40s. to 45s., springers £12 to £16, sucking pigs 17s. to 23s., stores 40s. to 45s. each. At ATHY fair the supply of store cattle was large. Prime stock was in very brisk demand, but inferior sorts were dull. At GOLDEN fair buying for the English market was brisk; milch cows brought £9 to £15, two-year-olds £6 to £9, yearlings £3 to £5. The demand for sheep was good, but the show was rather short. At KILLENANTE fair a good deal of business was done. At TEMPLEMORE fair the supply of store heifers was good, which were chiefly in demand, but high prices were also given for every other description of stock. Springers were enormously dear, up to £17 being freely paid for top beasts. Bullocks also in great demand. Strippers of good quality sold well, but those of an inferior kind were very cheap. The sheep department was thinly supplied, but some hoggets went as high as 53s., whilst for others 31s. to 45s. were freely given.

REVIEW OF THE CORN TRADE

DURING THE PAST MONTH.

The commencement of May was unpromising, the harsh wind, prevalent through April, still checking vegetation, and giving but little solace either to graziers, or agriculturists; but in the second week this austerity ceased, and a summerlike temperature commenced, which, with occasional rains, have quite changed the face of the country. The meadows lately so bare have become luxuriant, and corn of every kind has made rapid progress, but the wheat in many places, after such a vigorous exposure to severe frosts and drying east winds, shows many blank places, which, unless the future season should become highly propitious, gives but poor chance for a full crop. Some lands, as in Norfolk, look as well as need be, but the wide differences obtaining point rather to an average crop at best than to any surplus. The close of April showed some abatement on the previous advance; and the beginning of this month was dull, but eventually about 1s. per qr. was gained in value, with a calm state of trade, finer weather, and better foreign supplies. As respects prospects this side harvest, these must be greatly influenced by the weather. Should it all along prove fine, holders will, of course, be more disposed to sell. But as stocks have become moderate, and no very heavy foreign arrivals are yet expected, and moreover, as the high price of meat must necessarily give a large increase to the consumption of bread, we cannot anticipate much decline; while, on the other hand, the wants of Ireland being great, and harvest yet distant, the smallest adverse circumstance is likely to raise prices, and anything disastrous would do so seriously. There is also throughout the country a greater confidence in the value of all cereals.

Wheat and barley were being reaped in Egypt more than a month ago, and promised an average; they are now cutting, or cut, in Algiers with a satisfactory result; and everything looks well as yet in Portugal, Spain, and Italy, so that but for the bareness of stocks there would before this have been an important decline. All through France, Belgium, Holland, the Baltic, Southern Russia, and the Principalities there is a fair promise; but America is yet doubtful, from the numerous failures of autumn-sown wheat, which have had only a recent replacement with that of spring growth. With a favouring Providence the world will, therefore, again be abundantly supplied. But the vast increase of its population, and extended commerce every year, claim more, and bring to light those stores which formerly were wasted, or misused.

The following prices were lately ruling in the several countries noted: The best flour at Paris was worth 39s. 6d. per sack of 280 lbs.; and choice wheat about 55s. to 56s. Fine red at Louvain, 62 to 63 lbs. per bushel, brought 57s. per qr.; Polish at Amsterdam as much as 60s. 6d.; 62 lbs. Upland at Hambro' 55s.; Silesian red at Stettin 50s. 6d. per qr.; Pomeranian 52s. 6d. per qr.; the finest wheat at Danzig 55s. to 58s. per qr. At Odessa prices ranged from 40s. to 49s.; at Galatz 35s. to 36s.; in Egypt 36s. to 37s. for the low light quality of the country. Soft wheat at Naples has brought 53s., hard 55s.; and this was the price of the latter at Santander, while wheat at Arevalo, in the same country, was quoted 35s., and at Seville over 70s. for hard, but Santander is about the steadiest place in Spain. At Algiers the Arabs yet obtain 47s. per qr. for the remainder of the last crop. In America prices remain high. Red winter at New York was worth 50s. per 480 lbs., white 53s. 6d. to 58s., but the low spring Chicago was only worth 43s. per 480 lbs.

The first Monday in London opened on a good foreign and moderate home supply of wheat. The moning's contributions were short, more especially from Essex, but as the quality was but moderate, and millers had been free importers of fine foreign, trade was excessively dull, and Kentish factors found it necessary to take 1s. per qr. less to clear their stands of the best qualities; much inferior being undisposed of. But few foreign cargoes being in factors' hands, these obtained fully the previous rates.

The dulness of the London reports did not much influence country markets, Hull, Birmingham, Leeds, Manchester, and Gloucester being unaltered, and Newcastle quoting 1s. per advance; but Bristol, Sleaford, and Gainsborough were down 1s. per qr. Liverpool throughout the week was unchanged, the closing market being rather improved.

On the second Monday both the English and foreign supplies were rather short. The near counties sent up a better supply, the quality being rather improved. This enabled factors to make sales more readily, at fully the former quotations. The foreign trade also had more tone, and some sales were made at rather improved prices. The earlier country markets exhibited a similar trade to that of London, or were rather improved. Lynn, Birmingham, Newark, Sheffield, Bristol, and Glocester were only firm. Hull, Leeds, Boston, Burton-on-Trent, and Wakefield were 1s. per qr. higher. Leicester, Norwich, and Newcastle advanced 2s. per qr. London also, on Friday, closed dearer. Tuesday's market at Liverpool was steady, and on Friday a good demand was experienced at 1d. to 2d. per cental advance, or 6d. to 1s. per qr.

The third Monday's supply was again moderate as respects English and foreign wheat. Essex during the morning sent up but few samples. Kent had a fair show. The weather having become quite summerlike, there was much less activety in trade than on the previous Friday, and though some samples realized an advance of 1s. to 2s. per qr. over the former Monday's quotations, Kentish factors found little or no improvement in sales, several lots not being cleared. Though nearly at all the country markets an advance was asked, there were several places where it was not realized. This was the case at Birmingham, Sleaford, Louth, and Sheffield, but more generally there was a rise of 1s. per qr., as at Hull, Alford, Gainsborough, St. Ives, Gloucester, and Newbury; while Boston, Lynn, Melton Mowbray, and Spalding showed an improvement of 1s. to 2s. per qr. Liverpool on Tuesday maintained Friday's advance of 2d. per cental, which was again confirmed on the closing market.

The fourth Monday had a better English and large foreign supply. From the near counties there were also more samples showing of fair quality; but though the weather had become colder and rough, the market was dull, and prices underwent no change. In foreign there was no pressing, and but very little demand.

The imports into London for the four weeks have been 23,123 qrs. English wheat, 61,966 qrs. foreign, against 23,640 qrs. English, 87,194 qrs. foreign, during four weeks in May last year. The total imports into the kingdom for the month of April were 222,728 qrs. wheat, 177,268 cwt. flour.

The flour trade has been of an upward character throughout the month. For the first fortnight there was little or no change noted, though occasional sales of country sorts were made at rather more money; but on the third Monday there was an animated market, Norfolks advancing from 35s. to 37s., and even 38s. occasionally, while town millers, influenced by the steady rise in wheat, put up the top price to 50s., which was 4s. per sack over the previous rates. French and American also improved fully 1s. per sack and barrel:

The imports into London for the four weeks were 68,281 sacks English, 4,896 sacks 4,442 barrels foreign, against 75,369 sacks English, 24,211 sacks 5,396 barrels foreign for four weeks in May 1859.

The malting season having gradually waned during the month, prices for this description became nominal as the weather got warm. The supply for this purpose held out better than at one time expected. The first fortnight was steady as to price for grinding aud distilling qualities, but rates, especially for the latter, having for sometime past seriously risen, the demand slackened, and with an abundance of genial rain, the third Monday was easier in price, from 1s. to 2s. per qr. The fourth was also much cheaper, making the decline in distilling and grinding sorts about 3s. per qr. A great breadth of barley is said to have been sown in consequence of the high rates paid for malting sorts all through the season, and there is every probability that such will again sell well.

The imports into London for the four weeks were 4,365 qrs. British, and 38,957 qrs. foreign, against 1,339 qrs. British, and 26,321 qrs. foreign for four weeks in May 1859. The imports in April throughout the kingdom were 238,150 qrs., with 2,850 qrs. bere or bigg, and 101,028 qrs. maize.

The malt trade has been heavy all through the month, without any noticeable change of price.

Oats still being in limited supply till on the fourth Monday, have gradually been advancing through the month, and stocks in granary have become gradually reduced. From Scotland there have been almost no arrivals, and the Irish shipments were very trifling; those from the Baltic as yet being short of the general expectation. Large operations have taken place in Russia, and at St. Petersburgh it is expected that 600,000 qrs. will be forthcoming for the season; but should they principally come here, it will be late first, and the near countries not being likely to send enough, Swedish, Danish, and Russian sorts must be the principal dependence; and there seems every probability that rates will be comparatively high till next harvest. Nearly every market was more or less against buyers till the fourth Monday, which, being well supplied with foreign, lost 6d. of the previous rise, leaving the entire advance about 1s. for the month. The imports into London for the four weeks were, 2,975 qrs. English, 25 qrs. Scotch, 2,808 qrs. Irish, and 88,758 qrs. foreign, against 1,687 qrs. English, 5,961 qrs. Scotch, 10,935 qrs. Irish, and 123,148 qrs. foreign, for the four weeks in May, 1859. The total foreign imports for the kingdom in April were 113,177 qrs.

Beans have been firm, and rather tending upwards, more especially for English qualities, which have been in demand. The new crop of Egyptian is beginning to arrive at Alexandria, but is said only to be partial, in consequence of damage by high winds during the time of bloom. We anticipate but little change in prices this side harvest. The arrivals in the port of London were 2,997 qrs. English, 5,842 qrs. foreign, against 1,963 qrs. English, 2,582 qrs. foreign in May, 1859. The imports into the kingdom for April were 36,062 qrs.

Very little has been doing in peas through the month, yet dun and maples, from their scarcity, have improved in value 1s. to 2s. per qr.; but since the reduction in grinding barley there is little prospect of any further advance. Boilers have continued very little enquired for. Prices being little different to those for hog food have undergone no change. Stocks are said to be very short. The imports into London for the four weeks were, in English sorts 540 qrs., in foreign 2,118 qrs, against 571 qrs. English, and 950 qrs. foreign, for four weeks in May, 1859. The arrivals from abroad for April were 14,801 qrs. for the United Kingdom.

Linseed all through the month has continued to rule high; the steady export trade and active enquiry for cake, in consequence of the deficiency of fodder and high price of meat, contributing to the support of prices, which have increased 6d. to 1s. per qr. The seed season has closed with great disappointment to all concerned in it. Foreign arrivals, though not heavy, came in before the demand commenced, which was seriously checked by the backwardness of spring. This made holders of red cloverseed uneasy, and many sold at rates which would have justified a speculative operation. Supplies eventually becoming lighter, as suitable weather came, prices rose for consumption, and eventually some quantity was taken for holding over at 2s. to 4s. above the rates paid for sowing. Many farmers lost their seed by the untoward weather. White seed has gone down considerably; holders presuming too much on its scarcity, limited their own sales, and rates have become entirely nominal. Trefoil has also been sold low. Tares only go in quantity at feeding rates, and the imports all through the season have been to poor account, excepting some early shipments of large Brunswick. Canaryseed has remained low-priced without attracting attention, and the unremunerative prices seem likely to shorten its growth in this country. Rapeseed has been dull, and only fine whole mustardseed has been saleable. Carraway has ruled cheap, but with little demand. Other seeds much as previously quoted.

CURRENCY PER IMPERIAL MEASURE.

Shillings per Quarter.

WHEAT, Essex and Kent, white, new 45 to 56 ....old 46 to 57
,, ,, red new 44 53 ....old 46 51
Norfolk, Linc., and Yorks., red.................. 43 53
BARLEY, malting .... 30 to 36 ....Chevalier, new.. — —
Grinding .... 28 30 .... Distilling 30 31
MALT, Essex, Norfolk, and Suffolk .. 49 to 57 .. fine 60 70
Kingston, Ware, and town made .. 49 57 .. ,, 60 70
Brown .... 48 49 .. — —
RYE ....new — — .. 30 31
OATS, English, feed... 22 to 27 ...... Potato 28 31
Scotch, feed........23 28 ...... Potato 28 31
Irish, feed, white .... 22 to 26 .. fine 26 29
Ditto, black....................... 22 26 .. ,, — 27
BEANS, Mazagan........34 to 40 .... Ticks 37 39
Harrow..............36 45 .... Pigeon 46 50
PEAS, new, white, boilers 36 41 Maple 38 to 41 Grey 36 38
FLOUR, per sack of 280 lb., Town, Households 44s., fine 46 50
Country .... 37 to 38 ...... Households .. 40 42
Norfolk and Suffolk, ex-ship.................... 36 37

FOREIGN GRAIN.

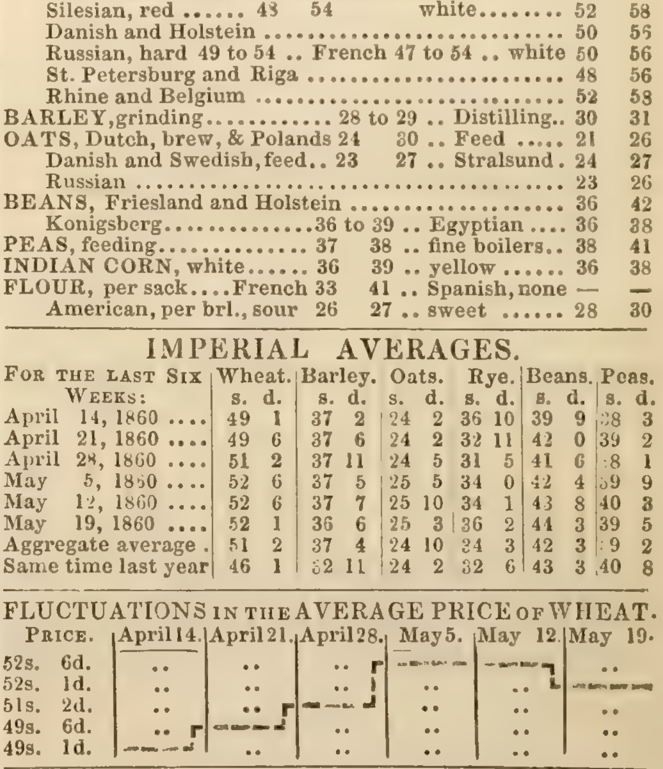
Shillings per Quarter.

WHEAT, Dantzic, mixed 56 to — high do. — to 58 extra — to 61
Konigsberg .... 50 58 ,, — — — —
Rostock .... 55 — fine 59 old 59 — —
American, white .. 50 53 red....48 to 54 — —
Pomera., Meckbg., & Uckermrk, red 53 56 — —
Silesian, red ...... 48 54 white........ 52 58
Danish and Holstein 50 56
Russian, hard 49 to 54 .. French 47 to 54 .. white 50 56
St. Petersburg and Riga 48 56
Rhine and Belgium 52 58
BARLEY, grinding............ 28 to 29 .. Distilling.. 30 31
OATS, Dutch, brew, & Polands 24 30 .. Feed 21 26
Danish and Swedish, feed.. 23 27 .. Stralsund. 24 27
Russian 23 26
BEANS, Friesland and Holstein 36 42
Konigsberg...............36 to 39 .. Egyptian 36 38
PEAS, feeding.............. 37 38 .. fine boilers.. 38 41
INDIAN CORN, white...... 36 39 .. yellow 36 38
FLOUR, per sack....French 33 41 .. Spanish, none — —
American, per brl., sour 26 27 .. sweet 28 30

IMPERIAL AVERAGES.

For the last Six Weeks:	Wheat.		Barley.		Oats.		Rye.		Beans.		Peas.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
April 14, 1860	49	1	37	2	24	2	36	10	39	9	38	3
April 21, 1860	49	6	37	6	24	2	32	11	42	0	39	2
April 28, 1860	51	2	37	11	24	5	31	5	41	6	38	1
May 5, 1860	52	6	37	5	25	5	34	0	42	4	39	9
May 12, 1860	52	6	37	7	25	10	34	1	43	8	40	3
May 19, 1860	52	1	36	6	25	3	36	2	44	3	39	5
Aggregate average .	51	2	37	4	24	10	34	3	42	3	39	2
Same time last year	46	1	32	11	24	2	32	6	43	3	40	8

FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT.



PRICES OF SEEDS.

BRITISH SEEDS.

Mustardseed, per bush., new 10s. to 14s. brown 12s. to 16s.
Coriander, per cwt. .... 14s. 16s.
Canary, per qr.................................. 50s. 54s.
Trefoil, new .... 17s. 21s.
Tares, winter, new, per bushel .... 0s. to 0s. 0d.
Linseed, per qr., sowing —s. to 64s. crushing.. 54s. to 58s.
Linseed Cakes, per ton................ £9 10s. to £10 10s.
Rapeseed, per qr.............................. 62s. to 66s.
Rape Cake, per ton.................... £5 10s. to £6 0s.

FOREIGN SEEDS, &c.

Cloverseed, red 38s. to 48s............ white 82s. to 90s.
Trefoil .... 17s. 21s.
Hempseed, small, —s. per qr........... Dutch —s. 40s.
Coriander, per cwt. .... 16s. 18s.

HOP MARKET.

BOROUGH, MONDAY, May 28.—The market remains without any material change since our last report, the demand being moderate, and prices steady. The bine progresses favourably, and the duty has been backed at £180,000. Our currency is as follows:

Mid and East Kents	80s., 105s., 140s.
Weald of Kents	62s., 75s., 84s.
Sussex	62s., 70s., 76s.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, MONDAY, May 28.—During the past week the arrivals, both coastwise and by rail, have been large for the season, which, combined with fine mild weather, has caused a great reaction in the trade. The following are this day's quotations—

York Regents	90s. to 120s.	per ton.
Ditto Flukes	90s. to 120s.	,,
Lincolnshire Regents	80s. to 100s.	,,
Dunbar ditto	100s. to 120s.	,,
Do., reds	100s. to 110s.	,,
Perth, Forfar, and Fife Regents	80s. to 100s.	,,
Do., do., reds and rocks	90s. to 100s.	,,
Irish whites	80s. to 90s.	,,

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, May 28.—Since our last report only limited supplies of potatoes have come to hand coastwise and by land-carriage. Their quality, however, is seasonably good. All kinds are a slow inquiry at the annexed quotations:

York Regents	130s. to 180s.	per ton.
Ditto Flukes	120s. to 160s.	,,
Scotch	100s. to 140s.	,,
Ditto Cups	110s. to 130s.	,,
Dunbars	120s. to 140s.	,,
Yorks	110s. to 140s.	,,

ENGLISH BUTTER MARKET.

LONDON, MONDAY, May 28.—We had indications of lower prices at the latter end of last week, but now, with cold and rough weather, the value is not much altered.

Dorset, fine	110s. to 112s.	per cwt.
Ditto middling	96s. to 100s.	,, ,,
Fresh	10s. to 13s.	per doz.

BELFAST, (Thursday last.)—Butter: Shipping price, 100s. to 114s. per cwt.; firkins and crocks, 10d. to 11½d. per lb. Bacon, 63s. to 65s.; Hams, prime 78s. to 82s., second quality 60s. to 66s. per cwt. Prime mess Pork, 92s. 6d. per brl.; Beef, refined 120s. to 130s. per tierce; Irish Lard, in bladders 66s. to 70s., kegs or firkins 60s. to 64s. per cwt. Pigs, 50s. to 57s. per 120 lbs.

WOOL MARKETS.

ENGLISH WOOL MARKET.

LONDON, MONDAY, May 28.—Since our last report rather an increased demand has sprung up for most kinds of English wool; but the limited quantity on offer has checked purchases. The stocks in the hands of the manufacturers continue very small. The inquiry for shipment to the Continent has been less active, owing to the rather large supplies of colonial purchased by foreign houses at the public sales now in progress.

Per sack of 240lbs.

Fleeces—Southdown Hogs	£19 10	to	£20 0
Do. Half-bred Hogs	19 0		19 10
Do. Kent	18 0		18 10
Do. Southdown Ewes & Wethers	17 0		18 0
Do. Leicester do.	17 10		18 0
Sorts—Clothing, picklock	19 0		20 0
Do. Prime and picklock	18 0		19 0
Do. Choice	17 0		18 0
Do. Super	15 0		16 0
Do. Combing—Wethermatching	20 0		21 0
Do. Picklock	17 0		18 0
Do. Common	16 0		16 10
Do. Hog-matching	23 10		24 0
Do. Picklock matchig	18 10		19 10
Do. Super do.	16 0		16 10

LIVERPOOL WOOL MARKET, May 26.

SCOTCH.—There is still a fair demand for the best class of laid Highland; inferior neglected; white Highland scarce. The market is pretty well cleared of the best class of Cheviots, and those now wanting have to be satisfied with the second rate.

	s.	d.		s.	d.
Laid Highland Wool per 24lbs.	11	0	to	12	6
White Highland do.	14	6		18	0
Laid Crossed do...unwashed	14	6		16	6
Do. do...washed	16	0		18	6
Laid Cheviot do...unwashed	17	0		20	0
Do. do...washed	19	6		26	0
White Cheviot do...washed	32	0		40	0

FOREIGN.—The attention of the trade is still taken up with the public sales now in progress in London; anything useful arriving here commands a ready sale on landing at late rates.

FOREIGN AND COLONIAL WOOL MARKET.

	Per lb.	s.	d.		s.	d.
German, Saxon, and Prussian.	1st and 2nd Elect	3	4	to	4	6
	Prima	2	4		3	0
	Secunda	2	0		2	4
	Tertia	1	8		1	10
COLONIAL:—SYDNEY—	Lambs	1	5½		2	7
	Scoured do.	1	5		3	0
	Unwashed	0	8½		1	4
	Locks and Pieces	0	8½		2	0½
	Slipe and Skin	1	3½		2	0½
PORT PHILIP—	Lambs	1	5½		2	5½
	Scoured do.	1	4		3	5
	Unwashed	0	11		1	4
	Locks and Pieces	0	10		1	10½
S. AUSTRALIAN—	Lambs	1	5½		1	8½
	Scoured do.	1	9½		2	6
	Unwashed	0	9½		1	4½
	Locks and Pieces	0	8½		1	5
V. D. LAND—	Lambs	1	11½		2	4
	Scoured do.	1	2½		1	11½
	Unwashed	0	0		0	0
	Locks and Pieces	0	0		0	0
CAPE OF GOOD HOPE—	Fleeces	0	10½		2	5
	Lambs	1	0½		1	10½
	Scoured	0	8		2	4½
	Unwashed	0	8½		1	3

MANURES.

PRICES CURRENT OF GUANO, &c.

PERUVIAN GUANO (per ton, for 30 tons)	£12 5 0	to	£0 0 0
Do. do. (under 30 tons)	12 10 0		13 0 0

ARTIFICIAL MANURES, &c.

Nitrate Soda per ton	£15 10 0	to	£16 0 0
Sulphate of Ammonia	14 15 0		15 5 0
Muriate of ditto	18 0 0		20 0 0
Corn Manure	7 0 0		7 10 0
Superphosph. of Lime	5 0 0		6 0 0
Salt	0 18 0		1 5 0
Coprolite (gr'd)	2 10 0		2 12 6
Ditto (whole)	2 0 0		2 2 0
Estramadura Phosph. of Lime for 70 p. ct. p. ton	4 5 0		4 10 0

Gypsum	£1 5 0	to	£1 10 0
Bone Ash, for 70 per cent.	4 10 0		4 15 0
South American Bones	4 15 0		5 0 0
London ditto, uncrushed	4 15 0		4 17 6
Do. ½-inch p. qr.	0 18 0		0 19 0
Do. dust	1 0 0		1 1 0
Animal Charcoal	4 10 0		4 15 0
Oil of Vitriol, concentrated, per lb.	0 0 1		0 0 0
Do. Brown	0 0 0¾		0 0 0

OIL-CAKES.

Linseed-cakes, per ton—		
Thin American, brls	£10 5 0	£10 10 0
Ditto bags	10 15 0	10 2 6
Marseilles	8 10 0	9 0 0
English	9 10 0	10 0 0

Rape-cakes	£4 10 0	to	£5 5 0
Cottonseed Cakes—			
American decorticated	7 15 0		8 0 0
Ditto, English	5 10 0		6 0 0

JOHN KEEN, Agent, 35, Leadenhall-street.

Agricultural Chemical Works, Stowmarket, Suffolk.

Prentice's Cereal Manure for Corn Crops	per ton	£8 10 0
Mangold Manure	,,	8 0 0
Prentice's Turnip Manure	,,	6 10 0
Prentice's Superphosphate of Lime	,,	6 0 0

Manufactured by Hodgson and Simpson. Wakefield, and Matthews and Co., Driffield, Yorkshire.

Nitro-Phosphate	per ton	£6 10 0
Ammonia-Phosphate	,,	8 0 0

LIVERPOOL GUANO AND SEED, &c. MARKET.

Guano, Peruvian	£12 0 0	to	£13 0 0
Do. Upper do.	5 0 0		7 0 0
Ichaboe, per ton	4 5 0		5 10 0
Patagonian	3 15 0		4 0 0
Saldanha Bay	4 0 0		6 0 0
Kooria Mooria	4 0 0		6 0 0
Pedro Keys	3 0 0		5 0 0
Sulphate of Amo.	14 0 0		15 10 0
Bone Ash	4 10 0		5 10 0
Brimstone, 2d & 3rd	9 17 6		10 7 6

Linseed Cake per ton—			
American, bags	£9 0 0	to	£9 7 6
English	9 12 0		9 15 0
Cotsd. Cake, decor.	7 15 0		8 0 0
Locust Beans p. ton	6 10 0		7 0 0
Nitr. of Soda, p. ct.	0 13 3		0 0 0
Linsd. Bomby, p. qr.	2 9 6		2 10 0
Cloverseed, American, red, new, per cwt.	2 0 0		2 1 0
Tallow, 1st P.Y.C.	2 14 6		2 15 0

SAMUEL DOWNES, General Broker,
Exchange Court, Liverpool.

END OF VOLUME LI.

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